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APRIL 1970 THE NAVAL AVIATION SAFETY REVIEW

section V

EMERGENCY PR

THINK ABOUT IT!

WARNING

Don't learn your aircraft by accident!

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The author of this article, a retired naval aviator, offers it as what he regards to be one of the most effective ways that an individual naval aviator can contribute to improved naval aviation safety. The specific incidents recounted are based upon recent aircraft accident and incident reports but the main theme of the article – the need to know your aircraft – is based upon his own experience. This experience includes about 3300 hours of total flight time, accumulated in a variety of aircraft and assignments. The bulk of his flight experience, however, was acquired while serving as a flight instructor in the Basic Training Command. The author credits this experience, with its stress on preflight preparation and inflight standardization, as the basis for placing such a high value on *knowing your aircraft.*

Don't Learn Your Aircraft By Accident

By W. E. Cumbie, Military Editor

THIS bit of advice (borrowed from a NATOPS manual) may be phrased somewhat backhandedly but don't let that turn you off. It's meaning is important enough for you to read on . . .

During FY 1969 there were nearly 40 aircraft accidents which were attributed to incorrect operation of some aircraft system or piece of equipment. In some of these cases the pilot simply forgot to do something such as lower the landing gear before landing, usually because he failed to use a checklist. However this is not to be a discussion of checklists, although they are very important. The primary subject to be addressed here is the need to *know your aircraft* and how to meet this need.

Knowing your aircraft is a relative thing. In days gone by, it may have been that some pilots did know their aircraft down to the last nut and bolt but the average pilot of today will never know any aircraft he flies in that detail. Nevertheless, he should learn much more than is usually required to just check out in aircraft he will fly.

The old routine of asking a buddy, "How about checking me out in the XY-2, on that cross-country you're taking this weekend," is pretty much a thing of the past. The new order of the day is to require a formal checkout under cognizance of a command with adequate facilities and qualified instructors. This insures that essential information is imparted to transitioning pilots and that all practical safeguards are provided during the checkout process. But what happens after the checkout is completed? What then? It's possible that far too many pilots barrel-roll, loop, strafe, bomb and split-ess their way through several hundred additional hours of flight time in a bird – *maybe even a lifetime* – without giving any further thought to studying the electrical system, fuel flow diagram, hydraulic system, etc., in sufficient detail. As long as the gages read OK, the warning lights stay unlit and the aircraft goes this way and that when stick and rudders are moved, there is a tendency to just accept this state of affairs until . . . . and unless the next flight calls for using guns or delivering ordnance, in which case there will be quite a bit of study and review on the operation of the particular equipment to be used. How about the other systems and equipment? When will

On the average the pilot has every reason to be confident that each flight will be successfully completed, even though he has very limited experience in that particular model.

you get around to really studying that electrical system again? Will it be right after you lose electrical power in the soup one night while attempting to recover from an unusual attitude? Let's hope not!

Suppose you are out one clear afternoon, practicing instrument flying and the tacan needle suddenly begins to point somewhere out in space, about 40 degrees away from the station, and continues to do so for the remainder of the flight. Will you know why? Will you know whether your course indicator is still accurate? Let's say you knew these answers but if you didn't, would you look them up at the end of the flight or would you be content to write the discrepancy on the yellow sheet and forget about it?

It is an undeniable fact that some pilots are indifferent at times about certain aircraft systems or equipment. Take the case of one A-4 pilot who had a bad experience with the AFCS (automatic flight control system). On a flight during the early part of his familiarization training in the aircraft he engaged the AFCS and the aircraft promptly performed a snap-roll plus a few other gyrations. The pilot got the AFCS turned off and decided not to use that particular system again – not even to check out its operation on the ground before flight. This fact never came to light until the pilot had accumulated almost 200 hours in model, at which time he was involved in a loss-of-control accident in the landing pattern. He ejected safely but the aircraft was destroyed. Cause of the control difficulties could not be positively determined but some unknown malfunction of the AFCS was suspected. The pilot's contribution to the accident – if any – also remains undetermined. But it makes you wonder at this pilot's lack of knowledge or curiosity about such a vital system in his own aircraft.

In another case an HU-16D crashed during an ILS approach to a strange field in near zero/zero weather conditions. Both pilot and copilot had more than 3000 hours of flight time and they flew what they thought was an ILS approach when in reality they had a nearby tacan station selected on the ID-249 (course selector) and consequently descended where they shouldn't have. They had only a brief glimpse of the ground before they crashed. Fortunately, both pilots and all the passengers survived. In view of these pilots' extensive experience it appears to be a case of simply failing to make a good cockpit check while getting set up for an approach. It also appears that they did not completely understand the cockpit instrument indications they observed. For example, they both noted conflicting indications on their two ADF instruments but neither one became sufficiently concerned to execute a missed approach. In addition, the aircraft was equipped with a radio altimeter but it was not turned on. The aircraft NATOPS Manual doesn't direct its use but an aircraft commander who is knowledgeable concerning all his aircraft's systems can always make good use of a radio altimeter during a near zero/zero instrument approach. It's unfortunate, but this aircraft commander learned to appreciate the potential value, if not the operation, of his radio altimeter – by accident!

As we said before, don't learn your aircraft by accident. Dig in and learn all you can about flying machines, especially the one you are currently pushing around the sky. This is said knowing full well that you have already undergone extensive training before getting your wings and have completed quite a number of written and flight tests on the aircraft you now fly. But you know that the average checkout in model does not provide opportunity for gaining a complete, indepth knowledge of your aircraft and its systems. Moreover, a lot of knowledge which is gained during checkout tends to slip away as time goes on. The checkout does provide sufficient knowledge and familiarity with the aircraft to allow it to be flown with a reasonable expectation that each flight will be safely completed. This expectation, in turn, is based on the assumption that the aircraft and its systems will perform correctly, or if they don't, that the limited knowledge which the pilot does possess will be adequate in most cases to take appropriate corrective action. This means getting the aircraft safely back on deck or failing that, to at least get back safely himself. Statistics prove that these expectations are reasonable and that checkouts can be accomplished with a high degree of safety even though in almost every case the pilot launches on his first solo flight while still being a long way from knowing all there is to know about the machine and its operation. This is due to the fact that the pilot flies well-maintained aircraft and has been alerted to and instructed about situations which are most *likely* to occur during each flight. Therefore, *on the average*, he has every reason to be confident that each flight will be successfully completed, even though he has very limited experience in that particular model.

The only thing wrong with this situation is that it does not provide any guarantee that the pilot will be

able to cope successfully with *anything* that can happen. "So what," you say, "if it's something I can't handle, it probably won't happen anyway." But . . . what if it *does* happen in spite of the best maintenance in the world and in spite of all the training which can practicably be administered in the time available? Well, that's one reason for standardized emergency procedures; inexperienced pilots can use them to good advantage even though they may not yet understand every detail of the reasoning behind them. So if the whatsit in the thingamajig which is located in the center of a component which can only be worked on by the original manufacturer goes blooey . . . . and you fail to recognize the cause of the ensuing problems, let alone come up with a solution to them, then you may (and probably will) be excused if you have 5, 10 or 25 hours in model. However, what excuse can you possibly offer for not knowing every detail of how your aircraft's hydraulic system operates after you have 900 hours in model?

Initially, you have a good reason for flying aircraft while you are still in the dark about some of the finer details of what makes the equipment tick but assuming you do have a few moments or hours to call your own from time to time, the reasoning behind not knowing your aircraft gets thinner and thinner as days go by and flight time accumulates.

You hear a lot nowadays about professionalism. To say that someone is professional implies that he possesses extreme competence in his occupation or pursuit. That's what we strive for . . . . extreme competence in the occupation of naval aviation and this includes knowing the primary tools of the trade; namely, aircraft. It follows that the more you are able to know about your aircraft, the closer you will come to fulfilling the ideal of professionalism. But there is a better reason for being as professional as you can. It's a practical matter of preserving your life and conserving naval aviation resources. Even though you enjoy an overwhelming statistical probability of safely completing each and every flight you launch on, you are going to launch on a lot of them before you finally hang it up at the end of your flying career. Likewise, each of your fellow aviators will also complete many flights. When you look at it this way, the statistics are not nearly as reassuring as those which were previously mentioned. Statistics say that quite a few naval aviators will be lost along with a lot of aircraft during the length of time which an average flying career encompasses. Statistically, it can also be shown that many of these projected accidents will be caused by less than optimum corrective action by the pilot because he had an inadequate knowledge of his aircraft or its systems. Thus, it makes sense for naval aviators, both individually and in the aggregate, to be prepared when problems arise at some future time, as they are sure to do – statistically speaking.

This is not a suggestion to ride off willy-nilly in all directions to try to learn everything at once. It is to urge every pilot toward developing the attitude of being a lifelong student of naval aviation science and to approach this educational process in a systematic manner.

You are subjected to a lot of training and instruction as a matter of course. You have already had extensive formal instruction in aircraft engines, aircraft systems, aerodynamics, navigation, etc., in preflight and during other phases of training. Since you received your wings you have, as a general rule, received additional instruction or review in conjunction with each checkout in different model aircraft – NATOPS, NAMO trainers, etc. In addition, you perform periodic training in OFT/WSTs and, of course, there's the actual flying – so, consider all the training in procedures, tactical flying, weapons work, navigation and instruments which you have received during actual flight and there is little doubt that *you are already professional trained*, in the accepted sense. But this is no time to rest on your laurels. There is still much to learn and relearn. The question is, are you doing all you can to increase your learning. Think about it. Consider your present aircraft, say an F-4. Stop for a minute and think about a typical flight of the past. There was hardly a moment of the flight when you were not depending upon the hydraulic system – to operate your brakes, flight controls, speedbrakes, raise and lower your gear, etc. Did you make it a point, either during the flight or after, to increase your knowledge of the hydraulic system? Or did you simply accept the fact that everything worked OK? Or do you already know every detail of how it works? If so, how about your inflight refueling system? Do you know all about it? How about your internal fuel transfer system? Aircraft have been lost because pilots did not know enough about a fuel system (in certain situations) to properly transfer fuel. What about your emergency landing gear extension system? In one case an aircraft was lost because the pilot did not know how to operate the system. He thought he did but when it came time to make an actual emergency gear extention, he mistook an unexpected movement of the control as an indication that the gear had been properly lowered. The result was a wheels-up landing. There have been a number of accidents caused when pilots attempted ILS approaches and crashed because they were not sufficiently familiar with either equipment or procedures. This may be because, historically, naval aviators have depended on and used GCA much more than they have used ILS. But

The IPB provides ready reference for identifying parts and equipment, but it is also an outstanding reference document for pilots bent on learning how something works.

think about it. How many other pieces of equipment are there in an average aircraft which are infrequently used but may be needed and needed badly upon occasion. Do you know all about all of them in your aircraft? For instance the rain removal system? Can you operate it properly every time so as not to damage the windshield? Or the air-conditioning and heating system in your aircraft? In one case a pilot mistook a more-or-less ordinary noise in this system as an indication of engine failure; the result was a lost aircraft, although the pilot survived in fine shape.

We could go on and on, filling pages with similar material but the point is, there are a lot of things pertaining to aircraft and aircraft systems which naval aviators (regardless of proficiency) can profitably devote time to learning. So where do you begin? Begin with your aircraft. Look around during the next flight you make and see if you don't see a lot of things which need studying or reviewing. The first place to look for answers will be, of course, the NATOPS Manual. But, don't plan on finding answers to every question there. Many, if not most answers you need will be there but some will not be. This means that you have to go elsewhere for the answer. Generally speaking, this will be a dual action involving the nearest technical library and related shops. The primary purpose of the technical library is to provide a central source of up-to-date information for use by maintenance personnel in performing aircraft maintenance. It is also an excellent source of reference information for individual pilots, so next time that attitude gyro incorrectly indicates 10 degrees right-wing-down throughout the flight, and no OFF flag appears, it may be worth your time to troop down there to find out why.

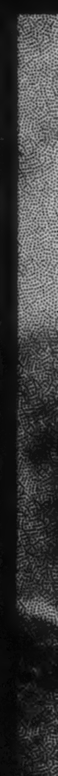
Space does not permit any substantial discussion of the technical library, item by item. Suffice it to say that you will find a comprehensive index of naval aviation maintenance publications there (NavSup Publication 2002). You will also find a MIM (Maintenance Instruction Manual), probably in several volumes, and an IPB (Illustrated Parts Breakdown Manual), probably in several volumes, for the aircraft you fly. In addition, there will be numerous miscellaneous publications such as technical manuals for specific pieces of equipment. But the two manuals previously mentioned, the MIM and IPB, will probably be the most frequently used reference material. The MIM shows how the aircraft and various systems are maintained. Therefore, it will also show how things work and in much greater detail than does the NATOPS manual. The IPB, on the other hand, is full of drawings which depict equipment in great detail. The primary purpose of the IPB is to provide a ready reference for identifying parts and equipment – but it is also an outstanding reference document for pilots bent on learning how something works.

When you get the answer, give some consideration to whether or not the answer (now that you have it) should be in the NATOPS manual. Maybe the matter is too obscure or insignificant to warrant placing it in NATOPS which, in many cases, is already voluminous. Let's suppose, though, that it *is* a subject to be included in NATOPS. Should you submit a recommendation proposing that Section II of the MIM be incorporated in the NATOPS manual? No, there's already too much material in the manual to warrant wholesale additions to it, so sit down and distill the essence of the information before you submit that recommendation. And, while you are about it, does that paragraph, chart or graph already in the manual present information in a readily understandable manner? Or does it require study and concentration in such a degree that the average reader tends to "skip it" unless he recognizes it as *absolutely* essential information? If so, maybe you can improve it. Somewhere out there . . . . in the Fleet . . . . is the knowledge and expertise to dramatically facilitate acquisition of knowledge by individual pilots. So bring it forth!

Acquiring knowledge of the tools of the trade and imparting it to others is a never-ending process in naval aviation. This process is the foundation of professionalism. Give it the very best you have to offer. In the long run, it will pay off for you and your squadron mates.

Some people take to NATOPS and the FTI a lot easier than others. We bet they will go a lot farther. About 50 or 60 years farther.

Anon.



Contributed by NAS, Los Alamito

CAUSE UNDETERMINED?

Short Snorts

It takes just as much effort to wish as it does to plan. Anon.

More About Those D . . . Birds!

AN Air Force jet transport was returning from a "routine mission" to southeast Asia and letting down to one of the island stops for servicing when a local bird – not a gooney but unidentified – bounced off the radome and over the top of the aircraft.

During the course of refueling, the radome was inspected very carefully, not only by the local maintenance personnel but by aircraft engineers and the aircraft commander. The only noticeable fact was that at the possible point of bird impact on the radome, the radome appeared somewhat softer than in other areas. After further analysis by maintenance personnel, it was deemed safe to continue the flight into Oahu. Takeoff, climbout and cruise were normal, so the matter of the bird strike was almost completely forgotten. However, things changed in a hurry – which is not at all unusual in the aviation business.

When power was reduced and the nose lowered for a normal descent to the approach and landing pattern at destination airport, the top portion of the radome completely separated from the aircraft. The first thing the crew established was that the aircraft was flying with maximum controllability at various speeds and attitudes, so the decision was made to continue the landing. Subsequent to the landing it was discovered that a major portion of the radome had disintegrated during the letdown. The only conjecture is that the change of attitude of the aircraft, from climbout with the nose up and normal cruise attitude to lowering the nose for descent, so changed the flow of air over the radome that the spot weakened by the bird impact was subjected to a different air pressure pattern, resulting in the collapsed radome. This is the first known case of delayed failure due to a bird strike and as such it merits consideration and attention in maintenance inspections.

A Toothpick?

A P-3 flight engineer was unable to re-engage the elevator boost handle following a simulated emergency. The aircraft returned to base and made a no-flap, elevator boost-out landing. Following shutdown the elevator boost was re-engaged by applying a lateral load to the handle. Subsequent inspection of the boost handle mechanism by a metalsmith disclosed a broken toothpick between the boost handle channel and the upper roller. When the toothpick was removed the boost handle operated freely. How a toothpick became lodged in the control boost handle could not be determined. It likely fell out of someone's pocket. The need for personal attention to FOD prevention cannot be overstressed.

Very Gently

TWO fuel bladders were being hauled externally to a fuel farm by a CH-53A. Both bladders burst when the pilot allowed them to make contact with the ground at a high sink rate. All helicopter pilots should remember to land external loads just like two porcupines making love – *Very carefully!!*

Arresting Gear

A TA-4F pilot filed an IFR flight plan from Midwest AFB to Mountaintop ANGB. On arrival, after an enroute descent and GCA approach, he landed on runway 32 (surface wind reported on final was 030/4). A normal touchdown was made but the pilot had to use full right aileron and right rudder for line up control. After about 1000 feet of roll he started a rapid left drift and elected to take it around – becoming airborne as he left the port side of the runway. Concerned about possible damage to his MLG, he asked to take the arresting gear (BAK-12) and was

advised that the MA-1A was in battery and located on the approach overrun only 70 feet in front of the BAK-12 and rigged for engagement in the direction opposite to the pilot's approach. He was further advised that it would take a minimum of 15 minutes to remove the MA-1A cables from the overrun and permit an approach end engagement. *His fuel did not allow the delay* and he elected to make a VFR approach to runway 32 to land beyond the MA-1A and try to engage the BAK-12. This time the wind was reported as 040/10 G 25. His touchdown was short of the intended point and his hook caught the MA-1A in the opposite direction of its intended use, causing the pendant to part. His hook then skipped over the BAK-12 and he became airborne as he left the runway off the port side again – taking a section of MA-1A cable with him. The third approach and final landing was made on runway 08 and, despite a blown left tire and inoperative right brake, he made a successful landing.

The pilot's first landing was made just as a frontal passage occurred and he was not advised of the increase in wind force. (The direction remained about the same.) No frontal passage had been mentioned in his weather brief and the tower operator did not advise him of the change to strong winds with high gusts. During peak gusts the crosswind component exceeded the TA-4F crosswind limitation. After his first waveoff he found himself backed into a corner. He had insufficient fuel to wait until the MA-1A could be disengaged, which would have permitted a routine field arrestment. It is not surprising that he caught the MA-1A cable on his second landing and got a hook skip over the BAK-12 – 70 feet is just not enough room for even the most precise pilot. As the C.O. pointed out in his endorsement, after the pilot found himself in a nearly untenable position his display of airmanship was commendable. The C.O. also suggested that in high, gusting wind conditions continuous wind information be furnished the pilot during an approach. (NavSafeCen would like comments from pilots and tower operators about this.)

The IFR-Supplement, United States, on page 7, contains a complete page of Jet Barrier/Arresting Gear information. In part II, J-Bar/A-Gear, in small print, there appears, "Caution – Up to 15 minutes advance notice may be required for rigging A-Gear for approach end engagements. MA-1A gear may not be used for approach end engagements." All Navy pilots are enjoined to review this section and the article, "Arresting Gear," in the May 1969 APPROACH. It makes good sense whenever you depart Homeplate on a cross country to know all there is to know about the field at your destination. In addition to having enough fuel you should be familiar with the geography of the field, the obstructions, lighting, runway servicing facilities – in short – *the whole nine yards.*

'He oughta be good, he's made all the mistakes.'

Too Heavy

THE PILOT of an SH-3 picked up from spot No. 2 on a CVS and, after a momentary hover, began forward flight. As he started climbing he heard a loud, staccato noise in the area of No. 1 engine followed by a complete power failure of No. 1. He was unable to gain sufficient airspeed to maintain single-engine flight or to hold his altitude despite full power on No. 2. He had lost one engine at the most critical point in the flight envelope. Sea and wind were calm as he landed in the water. Shortly thereafter he tried but aborted three single-engine takeoff attempts (his RPM drooped to about 85 percent). The fourth attempted takeoff was successful, after he dumped 1000 pounds of fuel, even though his RPM drooped to about 91 percent. He then made an uneventful landing back aboard.

Investigation revealed compressor damage as a result of FOD. A small, unknown object had been ingested by the engine and all fifth and sixth stage blades were damaged. Compressor stall followed by power loss resulted.

The pilot did an excellent job in making a successful open sea landing despite marginal control caused by decreasing rotor RPM. However, in his hurry to get airborne again and to get back to the "bird farm" he rushed himself. He overlooked the water takeoff checklist (overspeed, override switch was left off) and only after his third unsuccessful attempt to takeoff did he lighten the aircraft. After he had carried out the necessary procedures his takeoff worked "just like in the book."

In any emergency situation, after the decision is made to counteract the emergency, it is absolutely necessary to follow the correct procedures step by step.

SEVERE

IN the July 1969 issue we published a story concerning a pilot's encounter with thunderstorm activity. Fortunately, everything ended OK. However, so as not to lead you down the "primrose path," we think that a follow-up article is in order.

The need for exercising sound judgment when dealing with thunderstorms or when flying through other forecast areas of severe weather (such as severe turbulence or hail) is well recognized by experienced airmen. In order to increase this understanding, it would pay to understand better the role ATC plays in giving a helping hand.

Present ATC procedures provide controllers to assist pilots in avoiding areas of known severe weather, particularly when operating on IFR flight plans. It must be realized, however, that at times there are limitations to an air traffic controller's capability for providing such assistance. There are several reasons for this. First, the controller's primary responsibility is the safe separation of aircraft. No additional services can be provided which will derogate the performance of this responsibility. Secondly, limitations of ATC radar equipment, communications congestion and other air traffic may also reduce his capability to provide any additional services.

To a large degree, the help that is given by ATC will depend upon the weather information available to controllers and the requests made by pilots attempting to avoid severe weather areas. Due to the extremely transitory nature of thunderstorms, information available to controllers might be of only limited value unless frequently updated by pilot reports to supplement radar information. Inflight reports from pilots in direct communication with controllers giving specific information as to an affected area, altitudes, intensity and nature of severe weather can be of considerable value. When received by controllers, these reports will be relayed to other aircraft as appropriate.

Should avoidance of a weather situation enroute be

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WEATHER AVOIDANCE

desired, request a deviation from the route/altitude as far in advance as possible, including information as to the extent of deviation desired. An IFR clearance to circumnavigate severe weather can often be more readily obtained in the enroute areas away from terminals because there is usually less congestion and, therefore, greater freedom for course deviation. In terminal areas the problem is more acute because of traffic density, ATC coordination requirements, complex departure and arrival routes and adjacent airports. As a consequence, controllers are less likely to be able to accommodate all requests for weather detours in a terminal area or be in a position to volunteer such routes. Nevertheless, do not hesitate to advise controllers of any observed severe weather or ask to circumnavigate observed weather.

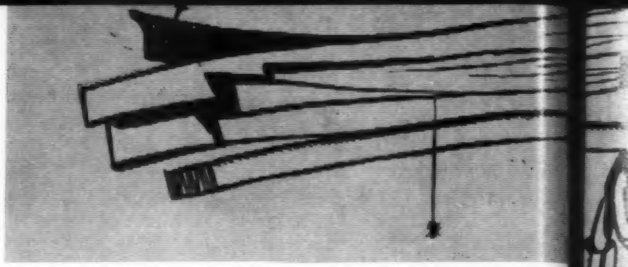
Those weather echoes observed on radar (airborne or ground) are a direct result of significant precipitation. All radar used for air traffic control purposes is not capable of equally displaying precipitation information. Under certain conditions in the past, the echoes received from precipitation have rendered ATC radar unusable. To avoid disruption to radar service, modifications designed to reduce precipitation clutter have been added to ATC radar systems. This feature, known as *circular polarization*, eliminates all but the heaviest areas of precipitation from the scope. Remember, all areas of precipitation will not appear on the controller's radar scope. Radar does not display turbulence. However, it is known that turbulence is generally associated with heavy areas of precipitation and controllers act accordingly.

Controllers will issue information about severe weather observed on radar when advisable and will, upon pilot request, provide vectors for avoidance whenever circumstances permit. However, for the above reasons, it should be emphasized to not completely rely on air traffic controllers to provide this service at all times, particularly in terminal areas or in holding patterns. Also remember that the controller's data is often far from complete due to design of the radar and its location relative to the weather observed.

In addition to primary surveillance radar, all Air Route Traffic Control Centers and some terminal facilities are also equipped with secondary radar systems (beacons). These secondary systems receive only those signals emitted by airborne radar beacon transponders and do not display weather echoes. Since all aircraft operating in positive control areas are required to be equipped with operating radar beacon transponders, controllers handling such traffic normally use only the secondary radar system. This permits filtering out nonpertinent traffic operating below positive control areas. Although controllers using only secondary radar will not see any weather on their scopes, they will, if alerted, often turn on the normal radar to observe weather, provided this does not result in weather clutter making the scope unusable for traffic control.

Recommended Pilot Actions

- All thunderstorms are potentially dangerous and should be avoided if possible or penetrated only when no other safe choice exists.
- Forward reports to ATC of any severe weather encountered giving nature, location, route, altitude and intensity.
- Initiate requests to avoid severe weather activity as soon as possible, being specific concerning route and altitude desired.
- Adjust speed as necessary to maintain adequate control of aircraft in turbulent air and advise ATC of action taken as soon as possible.
- Do not rely completely on air traffic controllers to provide information or to initiate radar vectors to aircraft for avoidance of severe weather, particularly when arriving and departing terminals or in a holding pattern.
- Plan ahead to anticipate the need for avoiding areas of known severe weather. If necessary, delay takeoff or landing, as applicable. ◄



I was leafing through my Funk and Wagnall's the other day and chanced across a really great word. It's just below "anthropophagi" (which means two or more cannibals), but this isn't going to be a lecture about cannibals and what to do when you meet them in a survival situation. Here's the word. Write it down and you will astound all your Air Force friends. The word is:

Anthropopathy

By LT W. J. Mooberry
RVAW-120

BEAUTIFUL, isn't it? Now for all the Yale men in our audience, I feel I must explain, anthropopathy is not a single cannibal. Anthropopathy is the tendency some people have to attribute human feelings and passions to gods or objects. Since gods and their passions are more properly the territory of the Chaplain's Corps, I'll limit our discussion to that anthropopathy which is directed toward objects; in this case, flying objects.

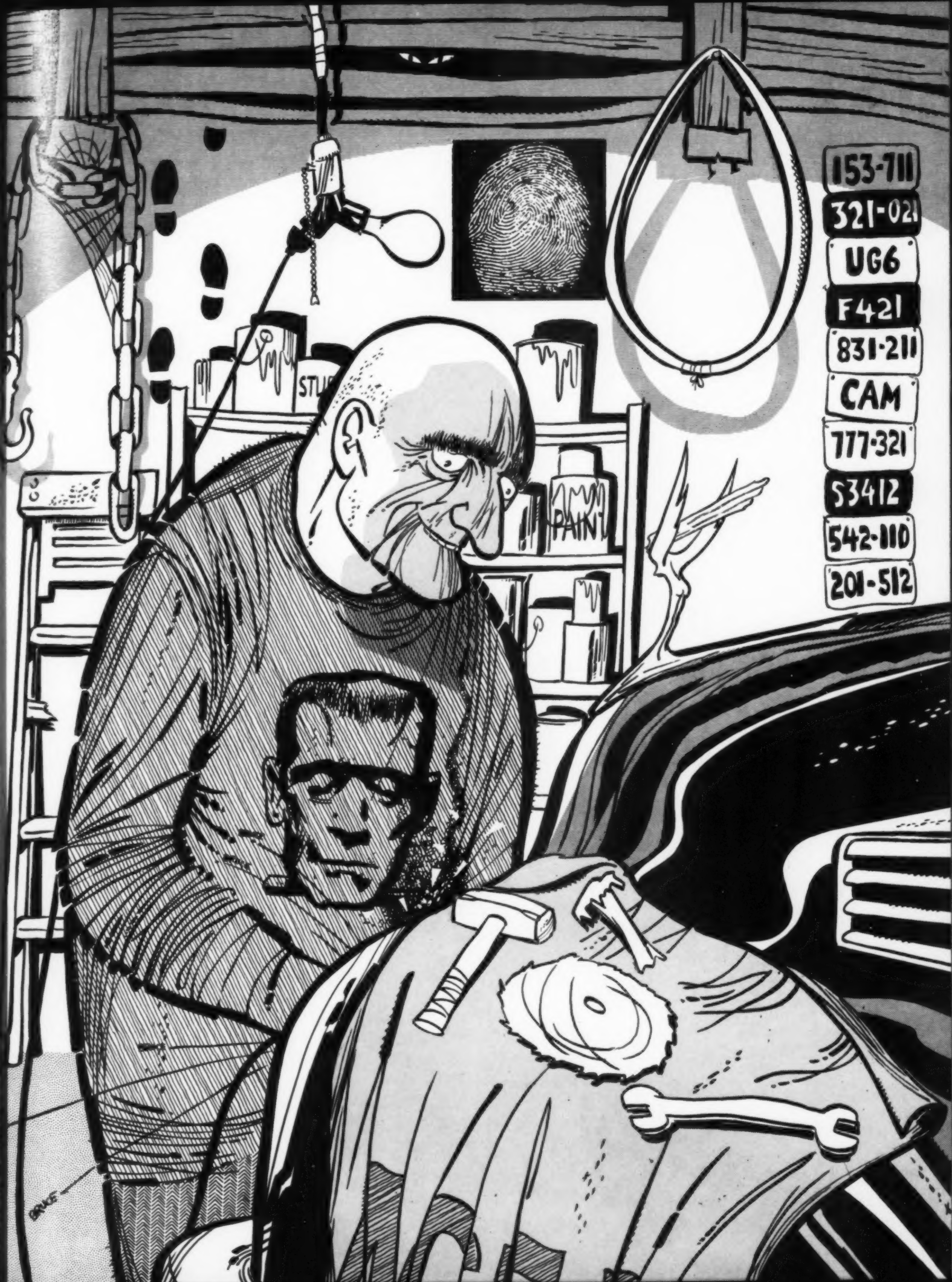
My research has indicated there are roughly two phyla (another great word) of flying objects: the animate and the inanimate. (Wake up, Norman, here comes the topic sentence.) You, good friend, along with gnats, birds and certain species of squirrels are one phylum and your aircraft is the other.

If you believe that, you may leave now. If you don't believe that (or if you are experiencing a serious blockage of the lower tract and have to sit there anyway) read on.

One of the finest examples of contemporary anthropopathy I've ever seen was in a movie called "Sweet Betsy." It starred Van Johnson as a freckle-faced 26-year-old Air Force colonel (twice passed over for brigadier) who thought his B-17 was a nubile young girl named Betsy. (A complicated Freudian hang-up which could account for some of his career difficulties.)

I can close my eyes and see it all in living color, wide screen and stereophonic sound. As the scene opens Johnson is nursing his battered, limping bomber back across the channel. Eight feet of his starboard wing have been shot away during a pre-dawn raid on the Jerries' roller skate factory near Berlin. His Huck Finn smile and nine million freckles were of little help over the heavily defended target; Betsy took a hell of a pounding. She's down on the water now skimming and sputtering along just above the top of the waves. The rest of the crew has long since bailed out. But the Colonel knows Betsy will see him through. She always has.

Sweat streams from his forehead. His teeth are


153-711
321-021
UG6
F421
831-211
CAM
777-321
S3412
542-110
201-512

clenched. He squirms in pain. (The Huns have shot away his relief tube.) He looks up. Dover just ahead. He smiles for the first time. The cliffs gleam white in the early morning sun.

He speaks. "Come on, Betsy girl, we've made it this far . . . just a little more. Come on, Baby, climb!" He pats the instrument panel. The aircraft shudders. Ecstacy, or pre-stall buffet?

His mind wanders back. What was it that Guido, the gunner, had said just before he jumped? "Anthropopathist!" Yeah, that was it, just before he jumped. Crazy guy, always so touchy about his religion.

He wipes the sweat away. The cliffs are closer now.

"Just a little more, sweetheart. We're gonna do it. Climb a little, Sweet Betsy. Betsy! Climb."

Splurch.

Paul Lynde, in the role of an out-of-work LSO, watches all this from the top of the cliffs. He reaches into his back pocket, pulls out a little green book, scratches his head and writes:

(OK) LOX LOAW (DECIC) P RAMP STRIKE!!

As the curtain falls Lynde is silhouetted against the early morning sky, still scratching his head and the camera zooms back to reveal a blackened blot on the white cliffs of Dover. All that remains of Sweet Betsy and the good Colonel is a smoky hole.

Too bad about the Colonel. Guido, the gunner, (and part-time religious fanatic) was right. The Colonel, you see, thought these galloping, wheezing, inarticulate conglomerations of sheet metal, pulleys and force vectors we call aircraft have souls. They don't.

A good moral for the movies you say, but what about real life?

Okay, Norman, real life:

You win the baseball pool and with the money you buy the very best electric handsaw you can get. You love your new saw. You name him Bruce. Your slightly squirrelly neighbor comes by to borrow your new saw. You've watched this cat try to shovel snow with a tile spade so you follow him (surreptitiously) to make sure he doesn't bleed to death when he saws off his kneecap. You peer through his garage window.

He plugs it in and waits a second or two as the saw comes up to speed. (So far so good.) You smile.

But suddenly he screams, "Come on, Bruce! Come on, Bruce baby! Atta boy, Brucie, you can do it." And tries to cut the bumper off his '49 Packard. By the time you get inside little Bruce is a smoldering, toothless lump.

Real life is exactly what we're talking about. Airplanes are machines. They are different from people. They don't have hearts. They don't care if you live or die. They don't care if *they* live or die. They have ultimate tolerances and design limitations which are set forth by the immutable laws of metallurgy and physics; they are constant and irrevocable and will remain so regardless of how much you wail or plead or pat their instrument panels and call them "Baby."

Little Bruce tried to cut the bumper off that Packard just like Sweet Betsy tried to fly over that cliff. And they kept on trying. Bruce kept spitting sparks and teeth until there was nothing left. Betsy kept flying until shortly after her plexiglass nose turret met that chalky white wall. Why? Not because they loved us. Because they were machines and had little control over the tasks their operators assigned them. They performed those tasks until those tasks destroyed them.

Phate? Nope. Physics in both cases.

What's it all mean, doctor?

Well, son, it means that the next time you figure you'll swagger out to the line and give old Betsy a swift preflight with the steel toe of your aviation sneakers and then take her up for a quick dash along the edges of the performance envelope, *stop*! Rub you eyes like a baby who just woke up and take another look. That's really not old Betsy there. That's Naval Aviation lifting device number 152786. A really dumb machine. You can paint teeth and faces and names all *over* it and nothing really changes. It's still a mindless machine that knows only what you tell it, honest.

Anthropopathy kills.

Advice

Whenever you're dubious about the value of planning well ahead, just remember one thing: it wasn't raining when Noah built the Ark.

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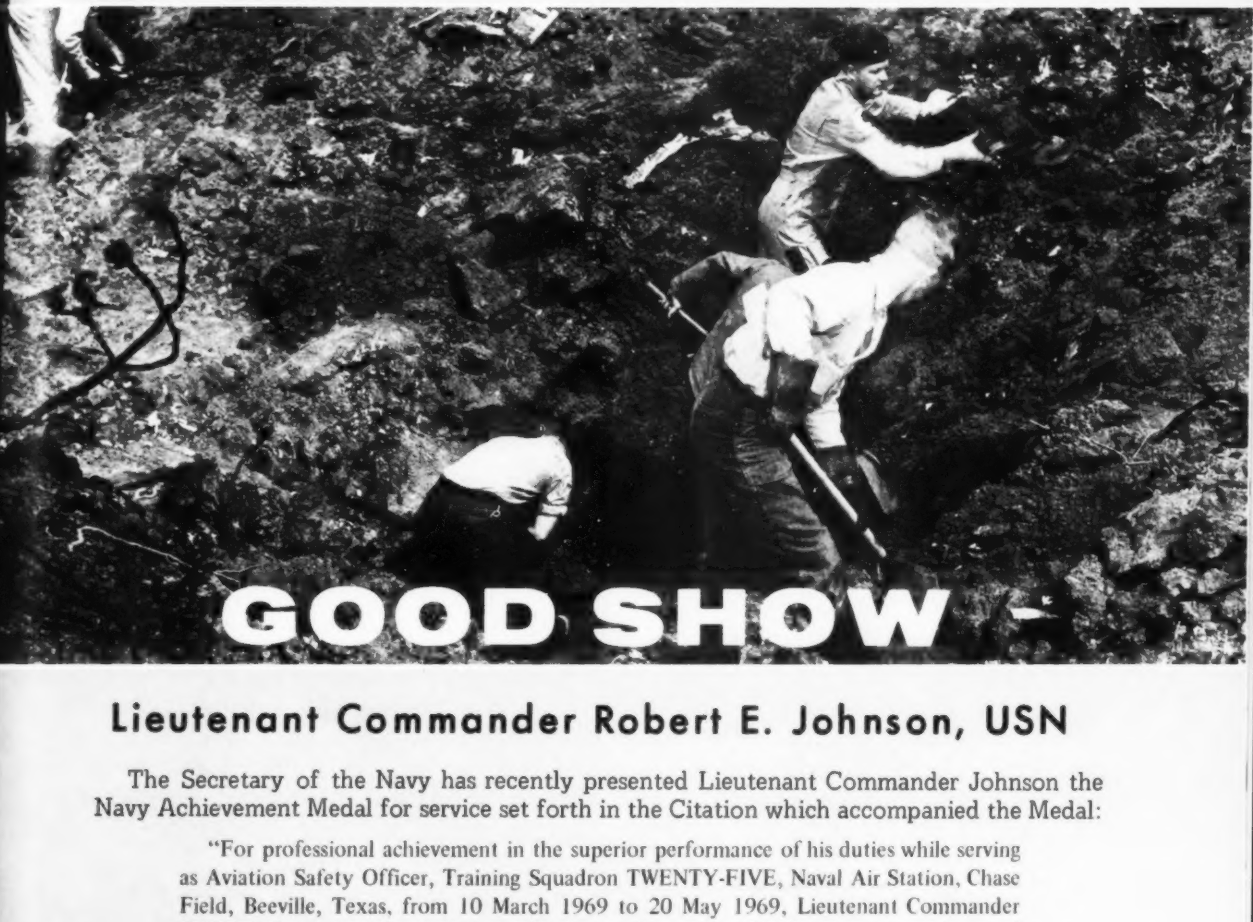
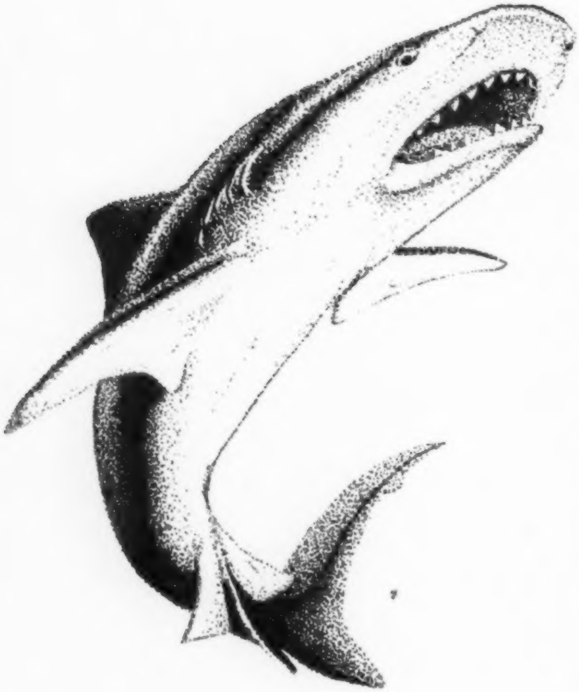


Lieutenant Commander Robert E. Johnson, USN

The Secretary of the Navy has recently presented Lieutenant Commander Johnson the Navy Achievement Medal for service set forth in the Citation which accompanied the Medal:

"For professional achievement in the superior performance of his duties while serving as Aviation Safety Officer, Training Squadron TWENTY-FIVE, Naval Air Station, Chase Field, Beeville, Texas, from 10 March 1969 to 20 May 1969, Lieutenant Commander JOHNSON consistently carried out his demanding responsibilities in an exemplary and highly proficient manner. Displaying exceptional skill, resourcefulness and superior investigative abilities, he contributed significantly to aviation safety in the Naval Air Advanced Training Command. Lieutenant Commander JOHNSON organized and conducted an exhaustive investigation to determine the cause of a trainer type aircraft accident. Through his extreme diligence, perseverance and attention to detail, and after days of an unusually thorough search through thousands of recovered pieces of wreckage, he personally located the one small component which was later determined to have been the causal factor. By further investigation and considerable personal liaison, tact and diplomacy by Lieutenant Commander JOHNSON, 24 other Naval Air Advanced Training Command aircraft with a similar faulty part were modified and engineering specifications were updated. His outstanding efforts resulted in the possible saving of these aircraft, further insuring the safety of their crews. Lieutenant Commander JOHNSON's professionalism, initiative and loyal dedication to duty throughout, reflect great credit upon himself and the United States Naval Service."

The following do's and don't's on the subject of sharks come from Dr. Perry W. Gilbert of Cornell University and the American Institute of Biological Sciences Shark Research Panel.



Shark

Advice to Bathers and Swimmers

1. Always swim with a companion. Do not become a lone target for attack by swimming away from a general area occupied by a group of swimmers and bathers.

2. If dangerous sharks are known to be in the area, stay out of the water.

3. Since blood attracts and excites sharks, do not enter or remain in the water with a bleeding wound.

4. Avoid swimming in extremely turbid or dirty water where underwater visibility is very poor.

Advice to Skin and Scuba Divers

1. Always dive with a companion.

2. Do not spear, ride or hang onto the tail of any shark. To provoke a shark, even a small and seemingly harmless one, is to invite possible severe injury.

3. Remove all speared fish from the water immediately; do not tow them in a bag or on a line cinched to the waist.

4. As a rule, a shark will circle its intended victims several times; get into a boat or out of water as quickly as possible after sighting a circling shark before it has time to make an aggressive "pass." Use a rhythmic beat with the feet and do not make an undue disturbance in the water as you move toward the boat or the shore. If wearing Scuba, it is best to remain submerged until you

Sense

have reached the boat.

5. If a shark moves in and there is not time to leave the water, try not to panic and keep the shark in view. A shark can often be discouraged by releasing bubbles or, at close range, by deliberately charging it and hitting it on the snout with a club or "shark billy." Since the hide of a shark is very rough and may cause serious skin abrasions, hit the shark with your bare hands only as a last resort. Shouting underwater may or may not discourage a shark.

Advice to Survivors of Air and Sea Disasters

1. Do not abandon your clothing when entering the water. Clothing, especially on the feet and legs, is your only protection against the rough skin of a shark.

2. Place wounded survivors in a life raft; all should use the raft if there is room.

3. Remain quiet – conserve energy.

4. If you must swim, use regular strokes, either strong or lazy, but keep them rhythmic.

5. Do not trail arms or legs over the side of the raft.

6. Do not jettison blood or garbage, for this attracts sharks.

7. Do not fish from a life raft when sharks are nearby. Abandon hooked fish if a shark approaches.

8. When a shark is at close range, use shark chaser if available – the black dye in it will repel many species of sharks.

9. If your group is threatened by a shark while in the water, form a tight circle and face outward. If approached, hit the shark on the snout with any instrument at hand, preferably a heavy one; hit a shark with your bare hand only as a last resort.

Advice to All

1. Always swim with a companion.

2. Avoid swimming at night, or in extremely turbid or dirty water, where underwater visibility is very poor.

3. Remain calm when a shark is sighted; leave the water as quickly as possible.

4. If an attack does occur, all effort should be made to control hemorrhage as quickly as possible, even before the victim reaches shore. If the wound is serious, the victim should be treated by a physician as soon as possible.

5. Adopt a sensible attitude toward sharks. Remember that the likelihood of attack is less than that of being struck by lightning. Attack is almost assured, however, when one deliberately grabs, injures or in some other way provokes even a small and seemingly harmless shark. ◄

SPLASHDOWN!

By LCDR David G. Venter
Manned Spacecraft Recovery
Force Atlantic

'I've got Sarah contact 045°'

'Visual contact - three good chutes dead ahead'

AND so it goes; the saga of Apollo recovery. The U.S. Navy plays a vital role in the recovery of our astronauts and their spacecraft. The zoom lens of the news pool TV camera aboard the PRS (Primary Recovery Ship) places a magnifying glass over the recovery forces and upwards of 500 million people, around the world, watch with interest as our astronauts once again become earthbound.

This saga of Apollo recovery does not just happen. It takes many hours of practice by the recovery team before the polished smoothness you see on TV takes place. To be more specific, the recovery team expends approximately nine times more hours training than they do on the actual end-of-mission recovery. The recovery forces rehearse at least once quarterly and as an actual mission approaches these rehearsals increase in frequency to the point where one is conducted every one or two days. As in most professionally conducted operations the singularly most important, continually stressed item in Apollo recovery operations is safety – and that's the subject of this article.

Helicopter recovery operations can be chronologically separated into three basic categories; training, shipboard operations and end-of-mission search and retrieval operations. The ASW helicopter squadron becomes the focal point of recovery operations. Their trusty steed, the Sikorsky SH-3 *Sea King* helicopter, has compiled an enviable record in manned space flight recovery operations. Since the days of the Gemini Project in 1965, these squadrons have flown from the decks of CVAs, CVSs, LPHs and LPDs. They've flown during CAVU and IFR weather conditions, day and night, with sea and wind conditions ranging from dead calm to gale force rough. Each of these conditions presents its own unique recovery problems.

The planning cycle for an Apollo mission begins several months before launch. After the forces have been assigned, individual unit training commences, slowly at first, under more ideal conditions so that helicopter crews and UDT personnel can become acquainted with each other's operating techniques. The training pace increases as the mission draws near. No longer are individual recovery techniques practiced separately. They are now welded together to simulate a full scale recovery operation. These rehearsals are conducted, both day and night, under varying sea and wind conditions. A typical mission summary would show that there are about 200 hours of practice accomplished before the end-of-mission recovery. Helicopter crews must be especially vigilant during deployment of swimmers. The UDT Team of three swimmers plus the command module flotation collar, sea anchor and other associated


UDT swimmers attach flotation and recovery gear to the module.

recovery equipment are deployed from the helicopter at 10-15 feet of altitude while it is moving at 10-15 knots of ground speed. Once in the water the swimmers proceed to the command module recovery training module. It is imperative that the correct altitude and speed be maintained since any deviation endangers the UDT personnel. To those helicopter pilots in the audience, salt water ingestion by the T-58 engine causes additional concern. The low altitudes necessary for swimmer deployment increases the salt ingestion problem if the correct flight envelope is not maintained.

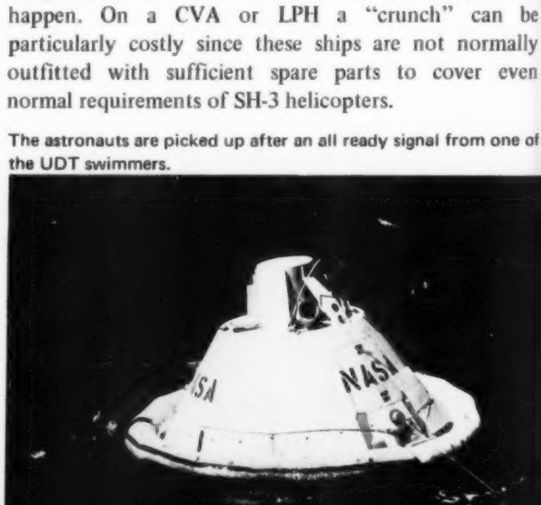
With shore based rehearsals behind them, the helicopter/UDT recovery team embarks aboard the PRS which could be a CVA, CVS or LPH. Shipboard flight operations associated with recovery operations are

The UDT swimmers deploy from 10-15 feet at 10-15 knots.

similar to normal shipboard helicopter operations with one big exception – civilians. Approximately two hundred civilians deploy with the PRS for each mission. For the most part they are not very familiar with the rules of their home-away-from-home and can be expected to show up in the most unlikely places at the most inopportune times. The equipment they bring aboard is equally mystifying. Trucks, vans, wires, antennas, diesel generators, cameras, dollies, etc., are mounted or stored in such a way that flight deck and hangar deck operating space becomes a premium. With foreign equipment on the flight deck, pilots and LSEs must be additionally alert for the unexpected, because maneuvering room becomes very scarce. FOD is always a hazard on flight decks but on a PRS flight deck the FOD problem becomes acute. Baseball caps seem to be the biggest offender and only through continuous indoctrination is a happy medium reached. Once deployed for the mission, practices take on an aura of authenticity since all the end-of-mission recovery units are finally working together as a recovery team. Coordination becomes the byword and as those of you that have gone through it before know, it takes some doing before a ship and squadron (strange to each other) work together as a well oiled machine; it does not just happen. NATOPS is a savior in disguise for without it recovery units would be ridiculously entangled in operating procedural problems.

The hangar deck becomes a yellow shirt's nightmare, especially on an LPH. The TV and recovery equipment is loaded aboard first, then the helicopters are stowed. The hangar deck becomes a "crunch" waiting for a place to happen. On a CVA or LPH a "crunch" can be particularly costly since these ships are not normally outfitted with sufficient spare parts to cover even normal requirements of SH-3 helicopters.

The astronauts are picked up after an all ready signal from one of the UDT swimmers.



Primary Recovery Ship Aircraft Array

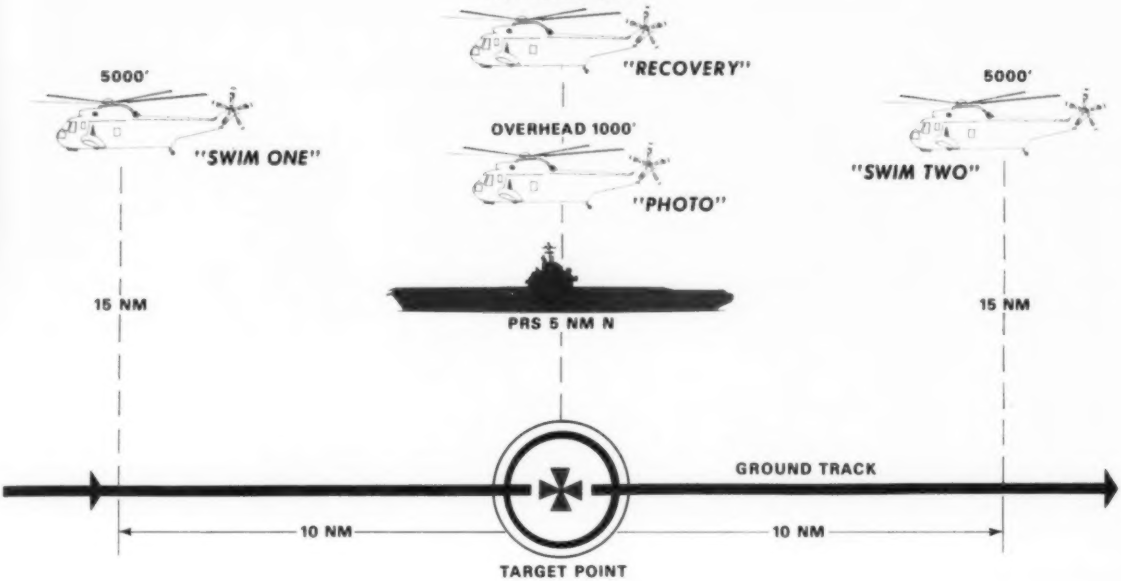


Fig. 1

During rehearsal or the actual recovery existing weather conditions naturally play an important role in determining the complexity of recovery operations. Although most recoveries (practice and actual) have taken place under better than average weather conditions, some *have not*, and they have presented quite a problem to the PRS personnel in CIC/CATCC/HDC. Air control is not an easy task at any time and IFR recovery operations are no exception. Prior to the scheduled splashdown, shipbased helicopters are positioned as shown in Figure 1. Additionally, at least two USAF Air Rescue and Recovery Service HC-130 aircraft are positioned in the landing area footprint, as is at least one Apollo Range Instrumented Aircraft (C-135 type). As the spacecraft enters the earth's atmosphere and these aircraft home in on the command module recovery beacon they tend to converge directly over the command module impact point. Especially during low visibility conditions, positive control by the PRS is mandatory. Once again the degree of proficiency displayed by recovery units plays an important role in the safety of recovery operations. After visual contact is attained by one of the recovery helicopters the retrieval operation commences and the fixed wing aircraft are either released or told to hold at altitude in the recovery area. If visual contact is not obtained, the recovery operation becomes considerably more complex. The search then becomes an electronic one, homing in on the command module radio beacon. Complicating matters further, the command module has turned upside down after landing (Stable II Condition) on many occasions, which places the radio beacon antenna and strobe light under water. Location under these conditions is extremely difficult. Search operations under low visibility or IFR conditions necessitates professionalism at every level. Positive control is a must, but is difficult with the aircraft at low altitudes.

After the command module is visually sighted one of the "swim" helicopters takes position downdrift of the command module and prepares to deploy the swim team and recovery equipment. During this time the "recovery" helicopter is positioned well downwind of the "swim" helicopter and awaits the signal to pick up the astronauts. Other helicopters, in the meantime, search for the command module parachutes and apex cover. As the UDT swimmers attach recovery equipment to the command module, the "swim" helicopter maintains a "lifeguard" position as close to the command module as possible without interfering with the operation. After the recovery equipment is attached to the command module and the astronauts are ready to egress, the "recovery" helicopter proceeds to position for the pickup via rescue hoist and Billy Pugh Net. The pickup is made with the helo at 30-40 feet above the

The end of a successful recovery.

command module. As each astronaut enters the Billy Pugh Net, the helicopter pilot increases the altitude of the helicopter with collective, the crewman raises the hoist and the aircraft is simultaneously moved sideward away from the command module. Once an astronaut is safely aboard, the helicopter moves back over the command module repeating the pickup steps until all the astronauts are aboard. If none of the other command module components are located, all helos then return to the PRS and another successful recovery has been completed. Under good weather conditions, this recovery operation takes approximately 45 minutes and is a smooth, well polished evolution.

The picture changes rapidly when adverse wind conditions occur. Surprisingly enough, *no wind* causes just as many problems as *too much wind,* with the ideal velocity being 10-15 knots. In addition to requiring more power to hover the helicopter with no wind, the rotor wash is directly under the helicopter, vice aft of the helicopter as it is with 10-15 knots of wind present. This rotor wash tends to blow the command module out from under the helicopter and the astronaut recovery operation can be delayed considerably. Since the pilot cannot see the command module when he is in position for the pickup, all movements are directed verbally by the crewman who operates the rescue hoist. In addition to all this, the salt ingestion problem increases since there is no wind to blow the spray aft.

Too much wind (25-30 knots) presents more problems to swimmers than it does to helicopters. In 8-10 foot seas it is extremely difficult to attach the sea anchor and collar to the command module. Swimmer placement by the "swim" helicopter directly on the extended drift line of the command module is an absolute necessity. The command module drifts at approximately 10 percent of the wind speed and if the swimmers are not positioned correctly they will never catch it. It is imperative that the crew of the "swim" helicopter keep the UDT team in sight at all times. During rough sea conditions the swimmers become exhausted very rapidly and help should be ready if it becomes obvious that they are experiencing difficulty. The backup "swim" helicopter must be ready to deploy its UDT team to render assistance. Once the command module is collared and the astronauts are ready for pickup the "recovery" helicopter pilot must insure that the high sea state does not cause the bobbing command module to come in contact with his hovering helicopter.

Of course the zoom lens is not trained on the recovery team during their practices so the viewers on recovery day are not aware of the behind-the-scenes action that has already taken place. Apollo recovery is not the piece of cake that it appears to be on the tube. The work is every bit as demanding as an ASW operation at Datum.

The big payoff in safe recovery operations is possible only through the repeated practice of each teammember's function and well coordinated teamwork.

A Page from the ASO's Songbook

May Showers

(To be sung to the tune of April Showers)

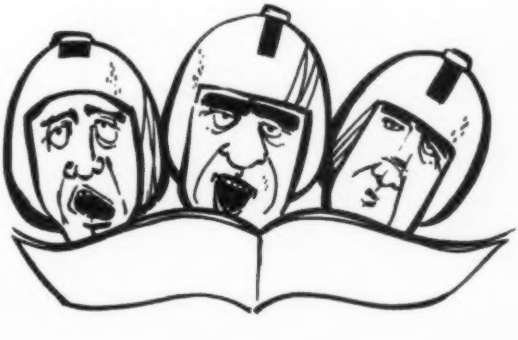
When April Showers have come your way,
They're closely followed by storms in May,
So when it's raining, please do not fail
To know it isn't only raining rain,
It could be raining Hail!

Those neat tornadoes that grow down South
Can leave dry cotton right in your mouth
Your destination can be a drag
If crosswinds make it so that you can't land
Unless a wire you snag!

Sometimes out West you find an anvil head
And if you're smart you'll know these things to dread!
They grow so gracefully and tall and proud
But if you find yourself inside of one,
Your heartbeat sure gets loud!

It's not to say that Spring can't be much fun.
The world is better when winter's done.
A little planning can save much strife
And bring you home each day to
Sing and play throughout your livelong life.

So make your Maydays be times of joy –
Of wine and laughter – of girl and boy.
And keep on looking at the weather with slightly shaded eye –
Don't waste one single Mayday when you fly.



Vertrep Problems

I WAS the aircraft commander of a UH-46D practicing a shipboard vertical replenishment exercise with a non-aviation ship and was utilizing the squadron's normal 2000 pound concrete block as an external load. To my knowledge this was the first squadron operation with this class ship (WW II AVP) and we had very little information on the ship's design and size. On sighting the ship it was obvious that the drop area was extremely small. Clearances from flag staffs and antennas were marginal as I hovered the helicopter and the rotor wash blew up considerable FOD including a rubber mat about seven feet square. About this time the load began to oscillate and I aborted the drop. I requested and received clearance to 50 feet from the aft most obstacle – just barely over the fantail area. I then made a second approach and a successful drop. After discussing the situation with the crew we hooked two pendants together thinking that a high hover would alleviate the pick-up problem. The pickup was successful but was not satisfactory and I terminated the exercise because of the problems mentioned plus ship's pitch and roll, which further complicated the picture. The ship's C.O. agreed on the termination.

The point I want to make is that the exercise was unnecessarily dangerous and I so informed the ship's personnel. This exercise is just one example of some of the problems we face when working with non-aviation ships. Deck crews are minimally trained in helicopter vertrep operations and necessary safety precautions. Furthermore, there is often a lack of current information available to pilots as an aid in operating with many classes of ships. I feel a certification system for use in determining suitability of drop areas would be extremely helpful.

Puckeredmouse

Since it was just an exercise with no emergency involved, your handling of the situation was exactly what was expected of you. You surveyed the area, attempted one approach and aborted when things were not to your liking. Your second approach and successful drop showed that it could be done – at least in one way. More experience undoubtedly will develop the best way. All helicopter pilots, whether engaged in rescue operations, routine personnel transfers or vertrep exercises, should recognize that inexperience and lack of safety precautions are common with crews of non-aviation ships. Operate accordingly! The best way to overcome these shortcomings would be to visit the ship (if the opportunity arises), conduct a series of briefings and preferably have some squadron personnel act as LSEs and safety observers during initial exercises. Next best would be to establish voice communications and conduct a short brief over the air. Shipboard personnel don't want to expose you to unnecessary dangers any more than you want to be so exposed.

Navy Tactical Doctrine Activity, Navy Yard, Washington, D.C., 20390, which publishes "SPLASH" (Shipboard Platforms for Landing and Servicing Helicopters) can give you information on many classes of ships. Their autovon phone number

is 22-32309/10. The kind of information that they publish about non-aviation ships is found in the centerfold of APPROACH May 1969 issue or FATHOM Winter 1969 issue.

Look Out!

THINGS became real hairy in a hurry while we were hoisting an engine to install it in a UH-2C. The hoist kicked out, hit my leg and almost knocked me off the helicopter. The engine fell on top of the helicopter, and nearly rolled off. It barely missed crushing one man's leg and if it had rolled over it would have taken me with it and hit another man below me on the way down. None of us had ever been involved in working on a UH-2C before. We were all SH-3A types. As it turned out a pin was not fitted on the bottom of the hoist (to prevent it from coming loose) and none of us knew it. All of this could have been avoided if we had been trained to do the job.

Philmouse

After reading your report and simmering down to just below 212° Fahrenheit we wonder just where in blazes the supervisors were? Can-do spirit tempered with know-how is great; without know-how it can be tragic.

Hazardous Maintenance Practice

AROUND 0200 one morning we were turning up a *Willy Fudd* (E-1B) to correct a couple of gripes. At the same time an AMS was in the nosewheel well checking the nosewheel doors and the brake accumulator. In the cockpit were two ADR2s and two AE2s (one of the AEs was new to our command). The AEs were checking a wheels warning light gripe while the ADRs were turning the engine. Before anyone in the cockpit realized what was happening, the new AE reached up, pulled the landing gear solenoid override and moved the gear handle to the up position. As the policy aboard ship is not to use groundlocks on the landing gear during at sea periods, the nosewheel began to retract. The AMS in the nosewheel well was able to get out of the wheelwell but his arm was caught between the strut and the downlock mechanism. The AE in the meantime (before the main landing gear could move) returned the gear handle to the down position, releasing the AMS in the wheelwell. The nose of the aircraft was prevented from dropping to the deck by the tiedowns on the tail of the aircraft. Had the main landing gear started to retract, the damage to the aircraft would have been quite extensive, not to mention the loss of life and personnel injury that would have occurred.

It is not the policy of this detachment, nor of our squadron, to check the landing gear actuation unless the aircraft is placed on jacks. However, it appears that somewhere in naval aviation there is a policy to check some landing gear gripes by using the solenoid override and then moving the gear handle momentarily to the up position, with the groundlocks installed on the landing gear. In this case, however, the landing gear groundlocks were not used. When ashore, groundlocks are always used but ship policies sometimes differ. Even with the groundlocks installed, this is a dangerous practice.

This detachment is now stressing to all maintenance personnel the dangers involved in trying to take maintenance shortcuts.

Fudd-mouse

The practice of checking landing gear operation without jacking the aircraft is a very dangerous procedure, as the incident you have recounted shows. We know of no authority or precedent for this practice and believe that it should be positively verboten. ◄

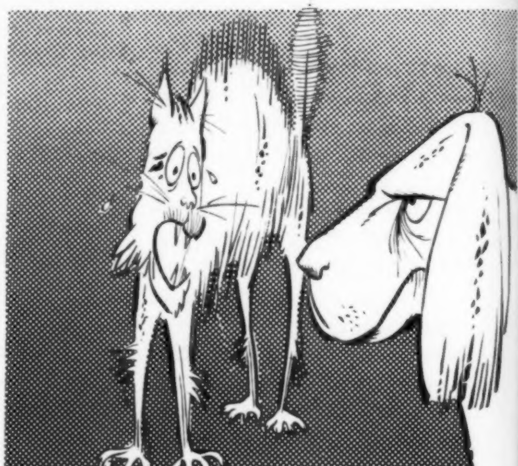
'Cat-a[nd Duck] Me[thod] of Instru[ment ...]

THE "Cat and Duck" instrument system has received much publicity and is considered to have much merit by those who have not tried it. No reports have been received from those who did try it, and none are expected. Pilots are invited to assess its merits objectively.

Basic rules for the C&D Method of flight under the hood are fairly well known and are, of course, extremely simple. Here's how:

1. Place a live cat on the cockpit floor; because a cat always remains upright, he or she can be used in lieu of a needle and ball. Merely watch to see which way the cat leans to determine if a wing is low, and if so, which one.

2. The duck is used for the instrument approach and landing. Because of the fact that any sensible duck will refuse to fly under instrument conditions, it is only necessary to hurl your duck out of the plane and follow her to the ground.



There are some limitations to the Cat and Duck Method, but by rigidly adhering to the following checklist, a degree of success will be achieved which will surely startle you, your passengers and even an occasional tower operator:

1. *Get a wide-awake cat.* Most cats do not want to stand up at all. It may be necessary to carry a large dog in the cockpit to keep the cat at attention.

2. *Make sure your cat is clean.* Dirty cats will spend all their time washing. Trying to follow a washing cat usually results in a tight snap roll followed by an inverted spin (flat).

3. *Use old cats only.* Young cats have nine lives, but old, used-up cats with only one life left have just as much to lose as you do and will be more dependable.

d-Duck
thod'
ent Flying

4. *Beware of cowardly ducks.* If the duck discovers that you are using the cat to stay upright, she will refuse to leave without the cat. Ducks are no better in instrument conditions than you are.

5. *Be sure that the duck has good eyesight.* Nearsighted ducks sometimes fail to realize that they are on the gages and will go flogging off into the nearest hill. Very nearsighted ducks will not realize they have been thrown out and will descend to the ground in a sitting position. This maneuver is difficult to follow in an airplane.

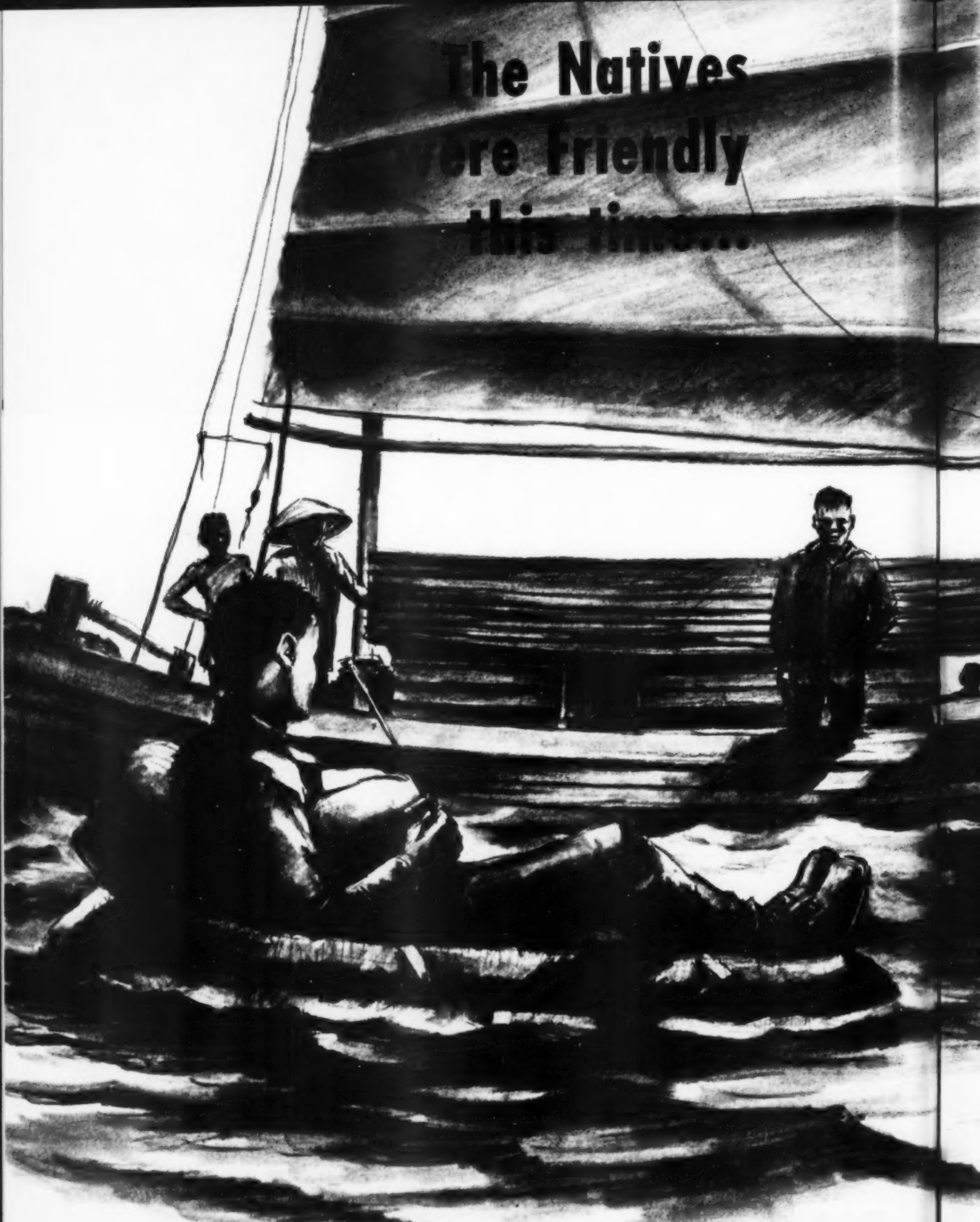
6. *Use land-loving ducks.* It is very discouraging to break out and find yourself on final for a rice paddy, particularly if there are duck hunters around. Duck hunters suffer from temporary insanity while sitting in

freezing weather in the blinds and will shoot at anything that flies.

7. *Choose your duck carefully.* It is easy to confuse ducks with geese because many water birds look alike. While they are very competent instrument flyers, geese seldom want to go in the same direction as you. If your duck heads off for Canada or Mexico, you may be sure you have been given the goose. ◄

From the student lounge, IFR Inc.,
Wold-Chamberlain Field,
Minneapolis, Minnesota

The Natives Were Friendly this time...



LOSS of oil pressure, probably due to failure of No. 6 engine bearing, required an F-8 pilot to head for his in-country bingo field. Seventy-five miles out the engine began to vibrate, there were three explosions from the rear of the aircraft and the engine started to unwind. The pilot countered this by pushing the throttle forward. He noted some engine response and then called his wingman to report the explosions. The wingman told him his plane was on fire and advised him to eject.

The pilot positioned himself erect in the seat, placed his feet on the rudder pedals and pulled the face curtain. The aircraft was 25 miles off the coast, 7500 feet altitude, wings level and in a descent of about 2000 feet per minute at 270 knots.

"I was conscious of the upward acceleration of the seat," he recalls. "As I cleared the aircraft the face curtain slipped to the side into the air stream and I could see that I was tumbling forward. There was a tug on the straps, followed by a second harder tug. I then found myself floating in my parachute."

He inflated his LPA-1, removed his oxygen mask and let it hang, still attached to the seat pan. He released his seat pack and the raft fell below him and inflated. He waved at his orbiting wingman to signal that he was OK.

"At 3000 feet altitude," he continues, "I spotted a sampan on the water below me. It looked as if I was going to land close to it and I became concerned that the occupants might be unfriendly. I took my PRC-90 survival radio from my survival vest and tried to contact my wingman, first on guard and then SAR common frequency but got no answer. Although I was getting good side tones and I could hear the guard beeper transmitting, I learned later that neither the cover aircraft nor the rescue aircraft picked up any of my transmissions. Finally I broadcast several times in the blind that I had just ejected, was in good condition and was about to land near a sampan. I put the PRC-90 radio on beeper and put it back into my vest. Then, considering that my wingman overhead obviously had me in sight and in the interest of conserving the radio battery, I turned it off. *(Both radios operated normally after the pilot was rescued. – Ed.)*

"As I got to about 1000 or 500 feet over the water, I sensed the downward relative motion and my raft started to swing erratically below me. I put my hands on the risers (I was not wearing gloves) and felt for the koch fittings. When I saw the raft hit the water I straightened my legs and pointed my toes. I released the koch fittings as my feet hit, went under and bobbed right back to the surface. The parachute floated well clear out ahead of me. I easily separated myself from the chute. I saw my raft floating about 25 feet away, swam to it, pulled myself in, belly down, rolled over and sat up. I noticed a

yellow substance in the water which may have been dye marker although I had not used the marker attached to my torso harness. *(This was probably dye marker from the equipment pouch of the PK-2 life raft. – Ed.)*

"I landed about a half-mile away from the sampan, which started heading in my direction after I landed. I considered taking out my pistol but instead I pulled out my PRC-90 radio and took off my helmet. I still couldn't contact anyone so I put the PRC-90 back in my vest and took out my PRC-63. I was unable to contact anyone on it either so I read the directions to make sure I was operating it properly. I had good side tones and broadcasted in the blind that I was all right and that the sampan was coming for me. While I sat in the raft my wingman made a few low passes over me and I waved my arms to signal I was OK.

"The sampan approached and pulled up alongside my raft. Three or four men were standing forward and a woman and two children were standing aft. An elderly man motioned several times for me to get into the boat and pointed to a heater or stove. He seemed to be trying to say that I could dry off or that they had food for me. I made several gestures with my arms indicating that I wanted to stay in the raft and that they should go away. My wingman flew over us at low altitude about that time. Apparently they understood my gestures because the sampan circled the raft once and then went off about three-quarters of a mile and remained there throughout the helicopter pickup. At no time did they take any hostile action.

"By now I could see an A-3 *Skywarrior* circling overhead and the mast of another boat out on the horizon. I found the lanyard tied to the raft and pulled in the seat pack which I was about to open when I heard a motor. Immediately I thought of the boat I had seen on the horizon and envisioned an enemy or unfriendly motor launch outbound to pick me up. I put the seat pack back over the side and swung the raft around 360 degrees but everything seemed the same as before. The motor noise went away so I sat and waited. After a couple of minutes I heard the motor again but this time it sounded like a helicopter rotor.

"I swung the raft around once more and sighted the helo about three miles off. I pulled in the seat pack again, opened it, cut off a smoke flare with my shroud cutter and lit the day end. Apparently the helo crew sighted it because they started toward me. The flare burned out and the helo stopped about a mile away so I lit off a second smoke flare. The helo then flew over me, orbited, returned and hovered. I put my helmet back on, rolled out of the raft and immediately became entangled with some underwater lines. Then I realized that I had not released my hip rocket jet fittings. I released these and my oxygen mask and swam about 30 feet away from the raft. A crewman in a bathing suit jumped from the helo into the water and the helo made another orbit.

"The crewman swam over to me and asked if I was injured. I told him that I was all right and floated in my life vest while he felt my arms and legs to make sure there were no broken bones. The helo returned and dropped something nearby (possibly a smoke flare), made one more orbit, then hovered some distance away and dropped a three-pronged rescue seat. The crewman pulled me over to the rescue seat and helped me onto it. Rotor wash from the helo was blowing water in my face so I put my helmet visor down. The crewman strapped me onto the seat and I was hoisted up and pulled into the helo. The helo made another orbit during which time I think the crewman sank my raft. He was then hoisted aboard and I was flown to the bingo field without incident. The only after-effects I had were a sore back between my shoulder blades and a stiff neck, both of which went away in a couple of days.

"I feel I might have done two things differently during this encounter: First, it would have been a good idea to have drawn my revolver when the fishing boat approached and second, I should have released my rocket jet fittings before entering the raft. The crew in the helo did an outstanding job in effecting my rescue and the survival training which I had received previously helped me immensely in my recovery."

The squadron commanding officer commented on the pilot's inability to use either the PRC-63 or PRC-90 radio in his endorsement.

"All squadron survival radios are periodically checked for proper operation, batteries tested and operable replacements provided when necessary. The apparent failure of the voice portion of both radios might be attributed to a hurried attempt to use them, further aggravated by local UHF traffic. The guard beeper was received. Subsequent testing of these same two radios in the exact condition they were received from the pilot revealed proper operation in all modes."

Pilots and air crew picked up in-country have stated that the survival radio is *the* one most valuable piece of signaling equipment which can be carried. Are you absolutely sure you will be able to operate your survival radio in an emergency? ◄

Safety is a responsibility, not a task.

Anon.

The following article was adapted from a letter received from Paramedic Rescue Team No. 1, NAS Cubi Point. We are certain that every pilot who finds himself alone in the ocean would like to be greeted with

'May I help you, Sir?'

By LT M. M. Persoff, MC
NAS Cubi Point, R.P.I.

I FEEL a few comments are due in regards to your article, "Room For Improvement," September, 1969 APPROACH.

I am assigned to Paramedic Rescue Team No. 1 at NAS Cubi Point. Almost three years ago we were assigned the task of instructing helo crewmen coming to WestPac in combat and non-combat water rescue procedures. Since that time we have instructed over 300 crewmen in our 6-day school. These crewmen have made over 50 actual rescues under combat and non-combat conditions – all being nearly flawless. The Navy thought so much of our course that they made a movie of it entitled "Up-Dating SAR" (MN-10749) which covers all the procedures we teach in our school.

Our course of instruction is based on the principle that the pilot is completely helpless immediately after an ejection. If he is not injured traumatically during ejection, he is certainly in a state of shock and a certain amount of confusion is present. He is trying to remember all of the things he has been taught in survival schools, which is quite a task for a man who just before his launch a short time ago was thinking of a hundred unrelated things.

When a crewman we have trained enters the water he puts the pilot at ease and takes charge of the situation. His calling card is "Good afternoon, sir, may I help you?" Then he proceeds to take care of the pilot and his equipment. The crewmen we train are taught never to cut shroud lines as our experience has proven this usually just compounds the problem. Our students are also taught to release koch fittings with one hand.

In your article, "Room for Improvement," it was stated that the pilot and rescue crewman couldn't find the koch fittings so they cut the risers. I think that it should be pointed out that if you can find the risers to cut them, then you should be able to run your hand along the risers, find and release the koch fittings. Pneumatic webbing cutters should only be needed in very rare instances. There was no reason to lower the rescue sling for the pilot in your article as he was already in the best rescue sling available, that being his

integrated torso harness. All the rescueman had to do was to attach the hook to the "V" ring on the pilot's torso harness and he would have been positively locked in. In such a case there is no worry about the pilot becoming fatigued and falling out or getting into the sling the wrong way. I don't know what equipment the crewman in the story had besides his wet suit but our crewmen are equipped for a water environment with swim fins, face mask and a less cumbersome UDT type life vest. Our crewmen are also equipped with rescueman's slings eliminating the need to lower the rescue sling at all. This sling has been proven effective in actual rescues as well as in tests.

The type of rescue made by the man in your article is the reason why our school was started. We feel very strongly about our techniques and procedures because they have been proven time and again under the most unfavorable conditions.

The Paramedic Team and other rescue survival training units such as HC-7, HC-5 and FAETUPac's JEST (Jungle Environmental Survival Training) school feel that it is time the Navy had professional rescuemen. We are in favor of having an air rescueman's rate and at this time are in the process of collecting and compiling information and material to support the need for such a rate. Our idea of a professional rescueman is a man whose primary duties are:

(1) To keep in excellent physical condition by a continuing and regular physical fitness program.

(2) To keep all of his equipment in good working order and in the proper place.

(3) To keep himself abreast of all the latest aviator's survival and rescue equipment.

(4) To be thoroughly familiar with medical techniques and procedures, (8 to 10 weeks of medical training).

(5) To be thoroughly familiar with the terrain in his geographic area of rescue responsibility.

(6) To be a qualified aircrewman in his mission aircraft, including the functions of a plane captain in that aircraft.

(7) To have designated cleaning functions aboard the aircraft but no maintenance responsibilities whatever.

(8) To be a qualified scuba diver and also have mountaineering experience.

These men could also have secondary responsibilities of running squadron training programs for the pilots and regular aircrewmen. These programs could include survival training, rescue procedures and physical fitness programs, to name a few. One of the biggest advantages of having a rescueman for a squadron is the squadron won't lose men from its maintenance department for what is now several weeks of training. If we had men with these qualifications as a *minimum* I think we could truly call them professional rescuemen. We feel it would certainly boost the confidence of the pilots and aircrews to know that they would have highly qualified men looking after them if they did find themselves in need of rescue.

We are now drafting questionnaires to send to all activities which have rescue capabilities in WestPac to find out how they feel about our proposal to have an air rescueman's rate. If APPROACH could print something about our position we might be able to get a greater number of comments from the people in the rescue business throughout the Navy. We feel this would be in the interest of aviation safety and when you are dealing with men's lives, nothing but the best should do.

The latest information we have here at the Safety Center on the subject of establishing a rescue aircrewman's rate is that the Office of the Chief of Naval Operations has looked at this matter several times and still feels that such a rate is not warranted because of 1) too limited a community; 2) no career pyramid and 3) a lack of rotational billets. However, CNO has approved a formal SAR crewman syllabus that is presently being conducted on a limited basis. Successful completion of the syllabus results in a SAR speciality designator for the trainee.

Your letter is extremely gratifying. If only all our Navymen had an equally professional attitude, we would be far better off. – Ed.

'Don't touch that handle!'

A TA-4F AIRCRAFT launched on a night instrument training flight with a young replacement pilot who had less than 30 hours in model in the front seat and an instructor pilot in the back. Following completion of the round-robin portion of the flight, the aircraft returned to the vicinity of home field for GCA practice. The aircraft was at 5000 feet when electrical problems arose; cockpit lights and warning lights flickered on and off and the intercom began to operate intermittently. The instructor pilot thereupon instructed the replacement pilot to deploy the emergency generator. The replacement pilot reached for the emergency generator but *incorrectly* pulled the canopy jettison handle instead. The canopy jettisoned and immediately thereafter, the instructor pilot was *ejected* from the aircraft. The replacement pilot managed to land the aircraft successfully but the instructor pilot, after landing in a marsh, had to hoof it to a road where he obtained a ride back to the field in an automobile.

Was this an isolated, unusual case? No, unfortunately, it was not as unusual as it should be. NavSafeCen records show that virtually the same thing recently occurred in another case, except the aircraft was lost. Here's what happened:

A TA-4F departed an air station on a post-maintenance test hop. The pilot in command was very experienced as was the copilot – but the copilot had only nine hours in model. The copilot, as a matter of fact, was in the process of checking out in this particular model aircraft and was along to gain greater familiarization with the aircraft.

The flight was conducted without incident until the return trip to Homeplate. The pilot called entry point and was cleared into the break. Shortly after this clearance, while inbound to the break, the pilot requested the copilot (in the rear seat) to deploy the emergency generator as a part of the maintenance test flight requirements. The copilot thereupon reached for and pulled a handle. Just as he pulled this handle he heard the pilot *warn him not to pull the canopy jettison handle.* Immediately after this warning, the canopy separated from the aircraft and the copilot was subjected to heavy windstream forces. The windblast lifted the copilot's hardhat and oxygen mask upward and forced his left arm up and into the windstream.

After canopy separation the pilot immediately retarded the throttle and actuated the speedbrakes (aircraft speed, altitude and attitude at this time was 300 kias, 1500 feet AGL, straight and level). The copilot struggled to get his arm back into the cockpit and as the airspeed decreased he managed to accomplish that task but shortly after he did so, he was ejected from the aircraft.

Following actuation of the speedbrakes, the pilot cycled the normal canopy actuation handle and found it loose, as if disconnected. Shortly after this check and at about 240 kias, the pilot was also ejected. Both pilot and copilot landed without significant injury and the aircraft subsequently crashed and was destroyed.

The investigation which followed was extensive and inquired into every aspect of the accident. Space does not permit a recount of all the findings, but the board concluded that the primary cause of canopy loss was due to the copilot's inadvertent operation of the canopy jettison system instead of the emergency generator system. Further, it was deduced (based on considerable physical evidence) that after canopy separation, the copilot's face curtain was dislodged either by his arm or windblast and that windblast had then further extended the face curtain, ejecting the crew. *(Note: The ejection seat selection lever was positioned to "Either pilot can eject both seats" throughout the flight. – Ed.)*

These accidents clearly indicate the necessity for pilots to become thoroughly familiar with their cockpit environment as early as possible during the checkout phase in new model aircraft. Operational flight trainers and weapons system trainers are excellent aids to pilots but the value of spending a few hours sitting in a cockpit . . . . and blindfold cockpit checks . . . . should not be overlooked. *Any way* you do it, cockpit familiarity is an absolute must for any pilot who expects to operate switches or controls in the cockpit during flight. ◄

Survival Radios and Rescue Beacons

ASK a pilot or crewman who has flown in Southeast Asia which single piece of personal survival gear he values most and the answer is very likely to be "a personal survival radio." The following authoritative information on personal survival radios and beacons comes from LCDR F. J. Quigley and LTJG S. C. Schiff (AIR-53341B), Naval Air Systems Command and is adapted from the December 1969 *Avionics Digest.*

Although sometimes combined into one system, radios and beacons are used for different purposes – the radio for two-way communication on one or more channels between the survivor and SAR personnel and the beacon to transmit a swept-tone signal from the survivor. The radio can be carried either on the person or in a parachute pack. The beacon is generally carried in the seat kit.

SURVIVAL RADIOS and beacons are fairly simple devices that must meet many requirements.

- They must transmit with sufficient power to be compatible with virtually all airborne direction-finding equipment.
- They must be small since space and weight are critical in high-performance aircraft.
- They must be able to perform under varied and extreme environmental conditions.
- They must be reliable.

Types of Transmitters

Three types of emergency survival transmitters are used by pilots and aircrewmen. The first, a hand-size radio beacon which has a self-contained battery and emits a distinctive signal, normally is mounted in the pilot's or aircrewman's RSSK (rigid seat survival kit), so that it is activated automatically upon seat ejection. The second, in addition to its beacon capability, contains a voice transmitter-receiver to allow a downed pilot to communicate with rescuers. The third, usually found aboard multiengine aircraft, is about the size of a small portable television set and has multichannel capability, longer service life and greater power output than the first two types. It is usually stowed in multiperson liferafts.

International agreement has standardized the beacon signal of all emergency and survival radios: it sounds like the whoop-whoop-whoop sound of emergency alarms on Navy ships. This feature is accomplished by periodic modulation of the r-f (radio-frequency) beacon signal with a swept (varying) audio tone. This modulated beacon signal also permits reliable bearings to be taken by UHF direction-finding equipment such as the AN/ARA-25.

Although the Navy has many types of survival radios and beacons available, only those particular radios and beacons currently in use and recently procured will be discussed in this article: the RT-60, AN/PRC-63, AN/PRC-90 and AN/URT-33.

Information concerning other radios and beacons (those phased out or being phased out, and those that are old or different) may be obtained from the articles entitled "Aircraft Survival Radios, Part I," and "Aircraft Survival Radios and Beacons" in the November 1967 and July 1968 Avionics Digest, respectively.

Figure 1. The RT-60.

RT-60 Radio Receiver-Transmitter

The RT-10 has been converted to the RT-60, which differs from the RT-10 only in these respects: It is a dual-channel unit (see Figure 1) and channel selection is accomplished by mechanical switching of a channel-selector switch. The RT-60 provides two-way voice communication with any standard UHF airborne communication equipment on two discrete channel frequencies. It automatically generates and transmits the standard emergency audio tone. There are five modes of operation:

• *Receive.* The antenna is extended completely until the base ring appears and an audible hissing sound indicates that the receiver is on.

• *Channel Selection.* For channel selection, turn the channel-selector switch to the desired setting.

• *Transmit.* Depression of the T-R switch turns the receiver off and the transmitter carrier on for voice modulation or C-W operation.

• *Swept Tone.* For a swept-tone signal, the tone lever is moved downward.

• *Simultaneous Transmission and Aural Monitoring of the Swept Tone.* When the T-R switch is depressed, the TONE switch comes on. Simultaneous tone transmission and aural monitoring takes place only on guard.

Problems

Some users have reported difficulties with the RT-60's channel-selector switch. Because of its design and location, this switch is subject to fouling. Users should select channels manually and not rely on the spring action of the switch to eliminate this problem.

AN/PRC-63 Radio Set

The AN/PRC-63 is basically a single-channel radio designed so that the beacon is automatically actuated. It is used by the Navy as a personal survival radio only. Shown in Figure 2, the AN/PRC-63 occupies about 16 cubic inches, has an MTBF (mean time between failure) of 800 hours and presents no serious shock hazard to the operator.

The AN/PRC-63 has been designed to be worn on the flight clothing or life jackets of aircrewmen. This radio generates and transmits the standard emergency audio swept tone or a continuous-wave signal and is capable of providing two-way voice communication with searching aircraft. The radio is designed to be compatible with all types of airborne direction-finding and UHF receiving and transmitting equipment.

A slide actuator turns the radio on (beacon mode) or off and a rocking toggle actuator is used to change from beacon transmit to either voice transmit or voice receive. A volume control is located in the upper right-hand

Figure 2. The AN/PRC-63.

corner of the set and controls the sound level of the beacon tone and the receiver. No other controls are required. The design is such that the set can be operated with either hand, gloved or bare. If the user should release the toggle actuator after the radio has been turned on, the set will automatically return to the beacon mode of operation.

The AN/PRC-63 requires no special maintenance – just battery replacement, servicing after immersion and routine periodic checks to ensure proper operation.

The battery is replaced as follows: The cap is unscrewed and the battery lifted out of the set; it is then replaced with one known to be fully charged. (The battery is designed to be inserted in one direction only – negative is closest to the cap.)

Servicing after immersion is accomplished in the following manner: The battery is rinsed thoroughly in fresh water and dried at a maximum temperature of 120°F (49°C). The radio can be rinsed and dried with the battery installed; however, it is recommended that the battery be removed if the set is to be oven-dried.

Because the AN/PRC-63 uses film hybrid microcircuitry, local repair is not authorized.

Problems

Field reports indicate that many users are operating the T/R/BEACON switch incorrectly. Users should note that, if they are to receive, the top half of the switch must be depressed (as shown in Figure 3). Use of the radio in the usual press-to-talk, release-to-listen manner results in voice-transmit or beacon-transmit operation only.

Figure 3. T/R/BEACON Switch (AN/PRC-63).

AN/PRC-90 Dual-Channel Rescue Transceiver

The AN/PRC-90 is the survival radio most recently procured for use by the Navy (see Figure 4). This dual-channel rescue transceiver is a logical extension of

Figure 4. The AN/PRC-90.

the single-channel AN/PRC-63. The AN/PRC-90 occupies about 23 cubic inches, weighs about 1½ pounds and is factory-set to transmit on guard as well as transmitting an emergency-beacon swept-tone signal and an MCW (modulated continuous-wave) signal. This set also provides two-way voice communication on specific crystal-controlled frequencies. Each channel receives UHF transmissions when selected.

Rotation of a function knob from OFF to either of its two voice channels permits the radio to receive. Rotation of the FUNCTION switch from OFF to the beacon channel permits automatic transmission of the beacon signal. A push-to-talk button located on the right side (see Figure 5) is used to transmit on the voice channels. Transmission of an MCW signal is accomplished only by selection of the MCW channel and utilization of the MCW key.

To control the set's sound level, a volume control has been provided in the upper left-hand corner. Like the AN/PRC-63, this set has been designed so that it can be operated with either hand, gloved or bare. For further information on the AN/PRC-90, refer to NavAir 16-30PRC90-1, dated 1 Sept 1968.

Problems

The major problem with the AN/PRC-90 radio set is with the whip antenna (Figure 5). Guidelines for maintaining operational efficiency of this antenna and a beneficial suggestion for the modification of the AN/PRC-90 earphone cord are given in the following paragraphs.

1. The AN/PRC-90 antenna is covered with silicone rubber which is subject to abrasions, cuts, tears and pinholes unless properly handled. Careless use can result in puncturing this cover with subsequent immersion in salt water causing rust, discoloration and stiffening of the antenna. While these conditions will not immediately affect performance of the radio set (nor will immersion of a bare antenna in water cause electrical damage), antennas with breaks in the covering should be replaced.

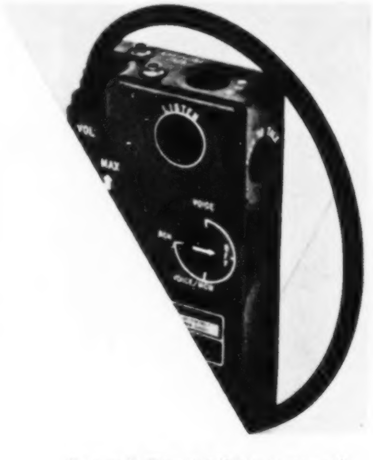


Figure 5. Flexible Whip Antenna.

Several activities have attempted to make the AN/PRC-90 antenna more durable by covering it with heat-shrink tubing. This procedure is not recommended.

2. A beneficial suggestion submitted by VA-163 concerns modification of AN/PRC-90 earphone cords to allow their use with helmet-mounted headsets. (See Figure 6.) Personnel may make this modification simply by baring the earphone wires and attaching a plug into which the headset jack may be inserted. When accomplished, this modification permits use of the AN/PRC-90 in helmet-on operations with varying degrees of effectiveness, depending upon the type of headset employed. It may, for example, be used during a helo pickup of a downed aircrewman or for airborne communications if an aircraft's radio has failed.

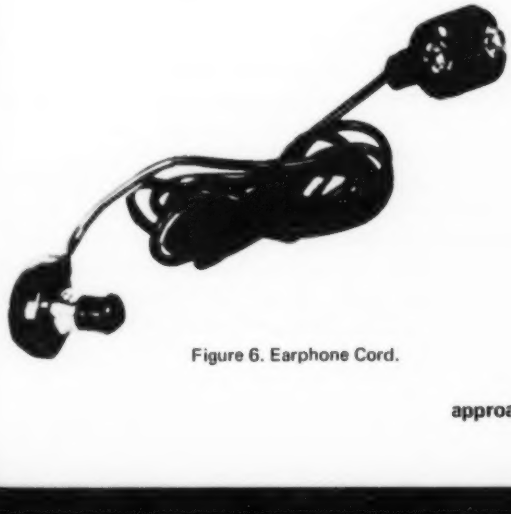


Figure 6. Earphone Cord.

AN/URT-33 Radio Rescue Beacon

The AN/URT-33, a radio rescue beacon designed to automatically begin operation during egress from a stricken aircraft, is installed in the RSSK of the aircraft's personnel-escape system. (Although it is automatically activated, the beacon can be switched to the manual operating mode at the discretion of the pilot.) The AN/URT-33 (Figure 7) weighs just over one pound and occupies nine cubic inches. It uses solidstate components mounted on a compact printed-circuit board and a standard mercury battery pack. It can be operated with one hand.

The AN/URT-33 transmits a pulse-modulated r-f signal that is swept-tone and crystal-controlled. Its signal power is concentrated and factory-set to operate on guard. When the beacon is installed in the RSSK, the pilot or aircrewman should release it as quickly as possible to ensure best radiation and maximum propagation of the beacon signal. After he descends, the pilot can remove the unit from the RSSK (if recovered) and use the beacon to back up his personal survival radio.

In the manual-operation sequence, the beacon is simple to operate. A slide switch is used to turn it on or off. When the unit is to be operated, the lanyard plug is pulled from the switch, the flexible antenna (if connected) is removed and the telescopic antenna is fully extended. Except for a three-foot retrieval lanyard, no other controls are required. The set can be operated by one hand, gloved or bare.

Field personnel at the organization level may replace components of the AN/URT-33 (excluding its battery), service the unit after immersion, replace certain mechanical parts and perform routine periodic checks to ensure its proper operation. If broken, however, electronic parts such as solidstate components and printed-circuit boards are nonrepairable. More information concerning the use and operation of the AN/URT-33 may be found in NavAir 16-30URT33-1. Details of RSSK installations are contained in Aircrew Systems Change 161.

Continued

Problems

It must be remembered that the AN/URT-33 was designed to be used during parachute descent and to perform only as a backup radio once the airman is on deck.

The UHF radios and beacons described above have certain peculiarities which should be understood by users. Briefly, during parachute descent, varying ground-plane, shadowing and directional effects cause unusual beacon radiation patterns (propagation). The overall result is to increase effective range two to four times. Once on the surface, however, survivors can expect a large reduction in range, which can be significant if the antenna is not oriented in a vertical position. On the ground, when the radio antenna is held in a vertical position, the radiation pattern is that of a doughnut with a very sharp null overhead. Another significant aspect of propagation is the large reduction in signal when the energy passes through jungle foliage. Studies in this area indicate that an attenuation of 90 db per tenth of a nautical mile can be expected in a typical jungle environment.

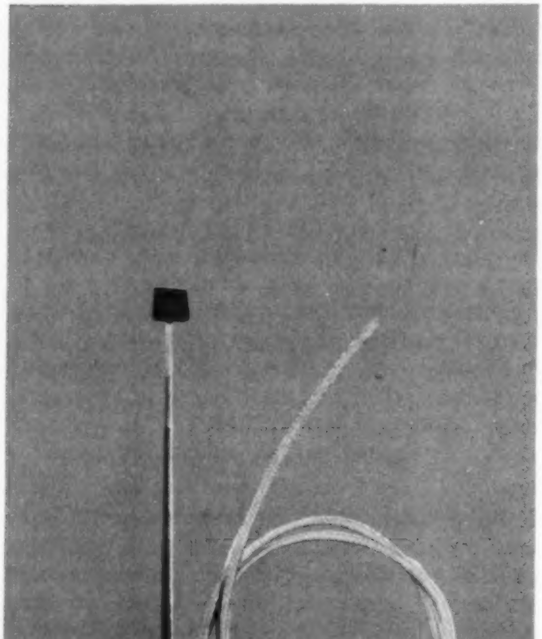


Figure 7. The AN/URT-33.

Precautions

To ensure better operation of survival radios and beacons, observe the following precautions:

1. Once on the ground, attempt to operate from a relatively clear area.

2. Freezing temperatures (32^{0}F or 0^{0}C) reduce the operating life of survival-radio and beacon batteries 12 to 15 percent. This is a temporary condition, however, and can be remedied by removing the battery from the radio and placing it against a warm part of the body.

3. Hold the antenna vertically and attempt to keep the radio more than 14 inches above the ground.

4. If attempting to signal an aircraft that is at a high altitude or approximately overhead, tilt the antenna slightly in a direction which places the edge of a hypothetical doughnut in line with the aircraft.

Inadvertent Actuation

Because all survival radios and beacons operate on emergency frequencies and reception of signals on these frequencies immediately initiates air-sea-land rescue operations, it is essential that these devices function only in *actual emergencies.*

Radios and beacons are frequently handled by aviation personnel and are subject to inadvertent actuation. It is important that users ensure that their personal survival equipment is off when not in use.

Information on special support equipment for radios and beacons described above appeared in *Personal/Survival Equipment Crossfeed 2-70.*

The ultimate goal is to have each jet aircraft or pilot escape system outfitted with a rescue beacon (AN/URT-33), each crewman outfitted with a personal survival radio (AN/PRC-90 or AN/PRC-63), and everyone concerned completely knowledgeable on the operation and maintenance of these valuable units of survival equipment. ◄

ENGINE FAILURE. . .

BRAKE FAILURE. . .

FIRE!

A YOUNG Navy lieutenant and his copilot approached the maintenance counter and asked for the yellow sheet for the station's HU-16. They were scheduled for a short test hop and if everything checked out they were to land, pick up a few passengers and depart on a logistics/training flight to a not-too-distant field. The test hop was routine and the pilots returned to board their passengers but were momentarily delayed. The port brake was reported to be hot. The brake was given a few minutes to cool and after the ground crew checked it, the pilots taxied to the runway for takeoff. During taxi the brakes operated normally with no indication of dragging.

The pilot was cleared onto the duty runway for turnup and, having completed his runup and takeoff checklist, was cleared to go. Wind was calm. Takeoff was routine and the pilot commenced a climb on course. Upon reaching 8500 feet, using climb power, the port engine began pumping oil overboard through the top stacks and out of the accessory section. Even though the engine was running smoothly and there were no abnormal cockpit indications the pilot secured the port engine, completed the engine failure checklist and turned back toward his point of departure – less than 20 miles behind him. He notified the tower of the emergency and began a letdown to the field. The single-engine approach was followed by a smooth landing on centerline, about 800 feet down the 8000-foot runway.

Immediately after touchdown the aircraft began a left swerve. Skid marks from the port tire started at the point of landing and increased in width as the tire wore down and the weight of the aircraft settled on the main mounts. The port tire blew about 1000 feet from touchdown point, threw pieces of rubber ahead of the plane, tore the brake lines loose and the main wheel fairing off the strut. The wheel assembly contacted the runway sending out a trail of sparks which ignited the hydraulic fluid from the broken brake lines. The aircraft came to a stop on the runway near the left edge, about 3000 feet after touchdown, with the port wheel assembly and starboard brake on fire. The pilot ordered the plane evacuated, secured the engines and all switches and left the plane himself. The crash crew was on the scene before the pilot evacuated the aircraft and promptly extinguished the fires.

Investigation revealed that the primary cause of engine failure was a hole, three-fourths inch in diameter in No. 2 piston of the port engine. No. 2 cylinder was disassembled and a piece of electrode from the rear spark plug was found to be missing. Primary cause for the port wheel locking on landing could not be determined. The port brake components were disassembled, tested and checked with no apparent discrepancies. The port wheel and bearing assembly were inspected and the bearings were found to be in good working condition despite being damaged by vibration and heat, although the severe vibrations and fire could have obliterated evidence of malfunction. There was no reason to believe the pilot, who was NATOPS qualified, landed with the port brake on. The swerve, which began at touchdown, required full right rudder and right brake to maintain some semblance of directional control and it is extremely unlikely that any pilot would have maintained left brake pressure under those circumstances. Evidence of mechanical failure could not be determined as a result of the blown tire and ensuing fire. The hot brake following taxi to the line after the test hop may have been an indication of impending failure. However, after cooling, the brake functioned normally during taxi out for the second takeoff.

The prompt and correct action by the pilot in securing the port engine undoubtedly prevented more serious damage to the engine. His subsequent single-engine approach and landing were "by the book" and his ability to stop the aircraft on the runway could well have been the difference between no injuries or serious injuries. By knowing NATOPS procedures cold this pilot stacked all the odds in his favor. To do less is to invite disaster. ◄

notes from your flight surgeon

Hypoxia

HYPOXIA caused the first engineer of an EC-130Q to lose consciousness in flight when he left his seat to assist a crewmember he thought was in trouble. He tried once to hook up to an oxygen regulator but was unsuccessful and continued aft, finally collapsing at the right-hand paratroop door.

The flight apparently had been progressing normally until, while cruising at FL 250, the master door open warning light illuminated. The pilot instructed the crew to be seated, secure seat belts and go on oxygen. A crewmember noted that the crew entrance door warning light was illuminated and so informed the pilot. The second engineer, in the flight engineer's seat, began depressurization and the door warning light went out as the cabin altitude passed 8000 feet. Depressurization was continued until the cabin was completely depressurized.

The second engineer passed hand signals for the first engineer, seated along the port forward bulkhead, to bring a restraining harness to the cockpit so the crew door could be checked safely. The first engineer did not understand the hand signals. He left his seat and walked completely around the cargo which ran the length of the compartment. On the way, he tried to hook up to one oxygen regulator, then gave up and continued aft, bypassing several other regulators in the immediate area. A crewmember forward saw him collapse near the right-hand paratroop door and notified the flight deck. The second engineer went aft with a portable oxygen bottle, administered oxygen to the unconscious man and revived him. The first engineer had been moving about for approximately three minutes without supplemental oxygen.

The aircraft made an emergency descent to 8500 feet and the pilot requested clearance to return to base. After landing, the first engineer was taken to the dispensary where he was released following medical examination. All oxygen regulators aboard the plane functioned properly during postflight check.

The probable cause of the door warning light was a combination of a loose forward door latch and a faulty micro-switch, the squadron report states. An inflight check of the crew entrance door showed both latches fully engaged. When the latches were checked after landing, the forward latch was slightly out of alignment and the corresponding micro-switch contact was loose.

Emergency procedures dictate that during a door open warning emergency, a crewmember must wear a safety device, either a parachute or a restraining harness, when moving about the aircraft. The second flight engineer did not wear such a device.

"All experienced flight crews should know that continual use of oxygen is necessary at altitudes in excess of 10,000 feet," the squadron C.O. states. "Failure to follow these basic procedures indicates a complacent attitude. To prevent a recurring incident, squadron flight personnel are receiving periodic training in the form of lectures and demonstrations on the proper procedures to be used for all emergency situations. The squadron flight surgeon is presently giving instruction on the symptoms, effects and prevention of hypoxia."

Has your squadron given any thought to hypoxia lately?

Burn Prevention

"THE pilot ejected at ground level, at five knots or less, his cockpit engulfed in flames. The fact that he was wearing a nomex flight suit and nomex gloves contributed considerably in preventing extensive burns."

From an MOR

In Retrospect

THE PILOT of an A-7B ejected after losing power following a cat shot. Minutes later he was picked up by helicopter. However, after it was all over the pilot commented that in retrospect he realized he was not as familiar with some escape and survival procedures as he should have been.

He had practiced reaching for the alternate ejection handle with his right hand on the stick while sitting on deck; however, when the emergency occurred, he grabbed for the face curtain handle with both hands and missed it. His second attempt at getting the face curtain handle *was* successful! He further stated that after ejection he forgot to inflate his Mk-3C life preserver during descent and did not inflate it until he began having trouble staying afloat.

"The solution to this is rather obvious and can be accomplished only by the individual pilot," the

investigating flight surgeon states in his report. "Survival training and escape techniques are taught by the squadron on a regular basis but it is up to the individual to know prescribed techniques so well that in an emergency situation he isn't required to take time to ponder the next course of action but is ready to act instantly."

LPU-2 Life Vest

MISRIGGING of the actuating lanyard on the left side of a pilot's LPU-2 life preserver prevented puncture of the CO_2 cylinder and inflation of that side. The pilot managed to stay afloat but he soon had other troubles. He became tangled in his parachute shroudlines and was unable to free himself from his parachute or seat pan because he did not have the required shroud cutter and his survival knife was inaccessible. He did not deploy his life raft. Seven minutes later a destroyer escort put a swimmer in the water (all helos in the area were down) and he was rescued.

The pilot's LPU-2 had been correctly installed on his SV-2 survival vest. However, the CO_2 actuating lanyard was wrapped around the base of the CO_2 cylinder at its connection to the inlet valve and prevented actuation when the lanyard was pulled. This problem appears to be possible only in the LPU life preserver, the squadron states. Both the Mk-3C and the LPA-1 life preservers have retaining straps around the CO_2 cylinders. The tight fit of the CO_2 cylinders against the side of the Mk-3C and LPA-1 life preservers due to the cylinder retaining strap virtually eliminates the possibility of improper rigging of the actuating lanyards.

The squadron submitted a UR on the lanyard problem and recommended an inspection of all LPU type life preservers to insure proper rigging.

Interim Air Crew Systems Bulletin 160 provides for the only configuration of the LPU approved for use by Navy or Marine aircrewmen. Illustrated folding and packing instructions from NADC (Naval Air Development Center) were reprinted in the December 1968 *Personal/Survival Equipment Crossfeed.*

Hawk Strike

WHILE an A-6A was on a routine daylight training mission, a hawk with a 3-foot wing span struck and shattered the windshield and the throttle quadrant, then smashed on the pilot's chest and head and splattered the back of the cockpit. The shock and noise were described later as comparable to a direct hit by anti-aircraft fire and both crewmen momentarily considered ejecting.

The pilot's hand was forced off the throttles and blown behind him by the combination of what the squadron report describes as "bird ingress and airblast." He then retarded the throttles, extended the speedbrakes and contacted the squadron on base radio. A squadron aircraft from another flight detached and joined up to lead the damaged aircraft into a downwind entry and uneventful landing.

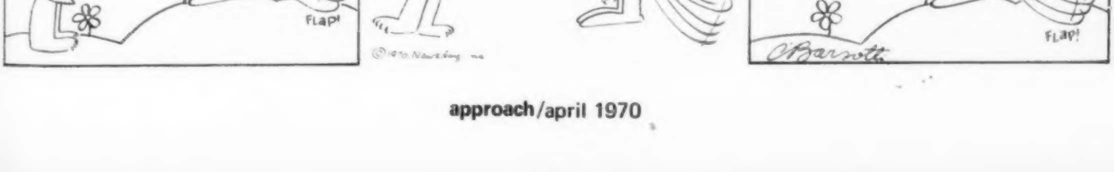
At the time the bird struck, both crewmen of the A-6A were flying with their gloves on, visors down and oxygen masks fastened. The pilot suffered only minor cuts and abrasions of the left arm and chest from the impact and flying plexiglas.

Personal survival equipment pays off in protection. In this case, it also helped save an aircraft.

Thunk!

AFTER flight ops secured, a plane captain working on the flight deck was struck on the head by an intake cover blown off an A-7. Although he was not wearing his protective helmet and was momentarily knocked unconscious, he was otherwise uninjured. The next man in this situation may not be so lucky. One lesson is obvious: wear all items of protective flight deck clothing whenever you are working on the flight deck. ◄

Sally Bananas by Charles Barsotti



The Deck is Fouled

THERE have been several aircraft carrier landing accidents or incidents during the past year where aircraft have been landed on fouled decks. The primary cause for this condition existing was inadequate or incorrect personnel actions, although in one case certain equipment malfunctions existed. In two cases, aircraft touched down while personnel were working on arresting gear equipment. No one was injured in the first case but in the second an arresting gear petty officer was seriously injured when he was struck by an arresting gear wire after it was engaged by the landing aircraft. It happened in this manner:

An A-4 aircraft had just completed an arrested landing when the arresting gear deck edge petty officer noted that a wire support (yielding element) on the No. 3 wire had partially pulled out of its retainer. At this time the arresting gear officer was at his regular recovery station (to the right of the foul line) and he activated the LSO's foul deck light. *(It is the duty of the arresting gear officer to "call the deck" during recoveries, giving clear and foul deck signals to the LSO by operating a "pickle" switch which in turn operates the LSO's clear and foul deck lights. – Ed.)* The arresting gear deck edge petty officer and an airman then went out on deck to repair or remove the damaged yielding element. Shortly thereafter, an A-4 made an approach to the ship but was waved off by the LSO. This led everyone concerned to believe the LSO was aware of the fouled deck, but such was not the case. The LSO, in reality, had waved off the A-4 because the pilot had flown a wide pattern which resulted in too close an interval between it and the next A-4 in the pattern. As soon as the LSO waved off the first A-4, he immediately turned his attention to the second A-4 in order to control it to a landing.

The hook spotter *was* aware of the foul deck and called "Foul deck," several times but the LSO either didn't hear or didn't understand what the spotter said. The assistant air officer, who was controlling the recovery in Pri-Fly, assumed like everyone else that the LSO was aware of the fouled deck so he turned his attention from deck activities to an aircraft overhead which had reported a hydraulic failure. However, the assistant air officer still maintained visual contact with the aircraft on final out of the corner of his eye and eventually he became aware that the LSO was not going to wave the aircraft off. At that time he actuated the waveoff lights from Pri-Fly and the pilot responded by immediately adding full power and retracting speedbrakes but the aircraft was too near the deck to prevent it from touching down.

In the meantime, one of the two men working on the arresting gear looked up and saw the aircraft approaching, tapped the other man on the shoulder,

yelled a warning and ran for the starboard deck edge. The second man ran for the port deck edge but was struck and seriously injured by the arresting cable during the runout which followed engagement by the aircraft.

There were no material failures involved which could be listed as a cause factor in this accident. It appears that the LSO became so preoccupied with the too-close interval between the two A-4s that he failed to check for foul/clear deck lights. This also appears to be the best available explanation of why he failed to hear the hook spotter's repeated "foul deck" calls until it was too late to prevent the accident. Even so, the accident might still have been prevented had the air officer insured the LSO was aware of the foul deck. His failure to do so was based on the assumption that the LSO's waveoff of the first A-4 indicated that the LSO knew the deck was fouled. Like everyone else on deck, he seemed to have been the victim of a certain unwarranted complacency.

The reporting command notes that in the future Pri-Fly will be required to notify the LSO by telephone or radio whenever the deck is fouled. This, of course, will be in addition to the LSO's foul deck light.

Another landing occurred on a fouled deck of a CVA recently. This incident did not cause any damage to equipment or injury to personnel but the landing aircraft (an F-4J) narrowly missed an RA-5C which was in the process of being launched. If the circumstances had been only slightly different, this incident could have been catastrophic.

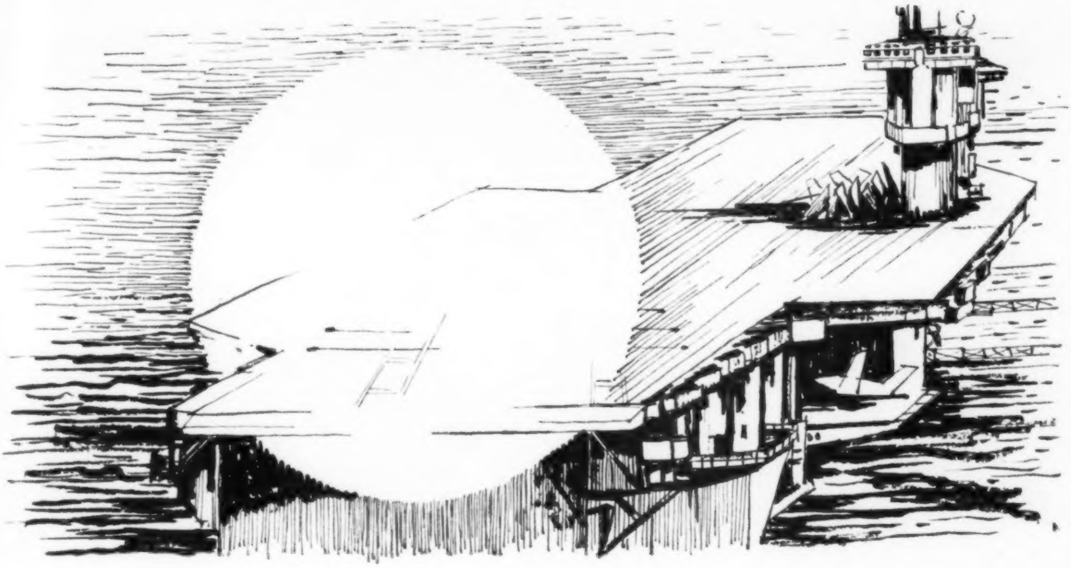
The ship at the time was conducting air operations primarily to accumulate data on ACLS (Automatic Carrier Landing System) Mode I landings. An RA-5C was spotted along the right edge of the landing area, being readied for launch from a forward catapult when the F-4J touched down. This situation arose when the Air Department assigned the F-4J a ramp time which was incompatible with the time needed to complete the scheduled launch of aircraft and man the LSO platform for recoveries. In this connection, the CVA/CVS NATOPS manual requires the air officer to obtain the ramp time of the first aircraft, insure that the LSO platform is manned, observe the deck and supply the LSO and approaching aircraft with information concerning the condition of the deck, 15 minutes prior to recovery of aircraft. The air officer apparently failed to give primary attention to the approaching aircraft. A radio transmission requiring a waveoff could have been made from the tower or through CCA frequency and would have prevented the foul-deck landing.

When the F-4J subsequently arrived at the ramp, the LSO was just getting the platform set up and tower personnel were preoccupied with the launch. Here are the details:

The F-4J was on a late afternoon CAP flight. The pilot called for and received Marshall instructions for a Case II, Mode I (full automatic, hands-off approach and touchdown) landing. The pilot had flown ACLS approaches to "minimums" on two previous occasions and was looking forward to his first ACLS approach all the way to touchdown. He departed Marshall on time, established contact with the radar controller on the "B" console of the shipboard ACLS gear and engaged the autopilot at eight miles. He received a "Locked on, coupled" report from the controller at about six miles and was able to couple with the full ACLS system shortly thereafter.

The sun was at a position 10 to 15 degrees to the left of the ship's heading and about 30 to 45 degrees above the horizon. The glare from sun and water was so intense that the pilot and RIO expected to have difficulty spotting the datum lights and meatball. Unknown to either, the Fresnel lens and datum/waveoff lights were set at minimum intensity (because they had not yet been adjusted for the forthcoming recovery). Both the pilot and RIO strained in an attempt to see the ball in order to judge the performance of the automatic landing system but at three-fourths mile, neither could see the lens nor anything else on deck because of the glare and the pilot, therefore, reported "Clara."

The LSO, who was just manning the platform, looked up, saw the approaching F-4J and attempted to wave it off with waveoff lights and by making a UHF transmission. Neither of these actions were effective. As



already mentioned, the light intensity was down to a minimum setting and the LSO's radio was not set to the CCA frequency which both the CCA controller and the aircraft were on.

The pilot, after calling "Clara" at three-fourths miles, waited for the LSO's response which never came; however, he was intent on monitoring the aircraft's performance under automatic control and did not pay any special attention to the LSO's lack of response. He noted that the controls reacted promptly and smoothly to the data link commands and the pilot judged the lineup to be excellent even though he could not distinguish features on the deck. Both the pilot and RIO found the distance, speed and altitude checks to be flawless. This occasioned a feeling of relief as the pilot regarded the approach as actually under IFR conditions, due to the intense glare of the sun.

As he crossed the ramp, the pilot could see a vague "shape moving out of the landing area." Acting on reflexes, he applied left stick dropping the left wing and then quickly leveled the wings again as the aircraft touched down, engaging the No. 1 wire. The rollout was left of the centerline but was within normal limits.

The "shape" which the pilot had observed was the RA-5C which was being respotted for launch and a collision was only narrowly averted. The pilot later stated that his first indication that the deck had been fouled came during rollout; and that as the aircraft came to a stop, he realized that he may have landed without having received the LSO's acknowledgement. Both the pilot and RIO looked about the flight deck after arrestment and realized simultaneously that there were no *yellow shirts* ready to control their deck movements. The RIO was the first to give voice to the fact which was obvious to both: "We must have landed on a fouled deck."

There is a NATOPS requirement for a pilot to take his own waveoff under VFR conditions when the ball is not sighted and/or no communication with the LSO has been established. Since the weather in this case was technically VFR, the reasoning of the pilot in completing his approach to a landing without having sighted the meatball or gaining radio contact with the LSO is questionable. But, the pilot's reasoning cannot be adequately assessed without also considering the fact that he was making a Case II, Mode I ACLS approach to the ship, albeit a practice one. Moreover, in this case the pilot was depending heavily upon the ACLS (as he would in an actual IFR approach) because of the glare of the sun. In this sense, it appears that the pilot accepted the smooth and correct functioning of the ACLS and the various radio exchanges with the CCA controller as his "ticket" to come aboard.

A number of other pilots on board were questioned after the incident about their understanding of the requirements (visual and audio) for "coming aboard." Nearly all of them indicated an understanding that the presence of a ball and LSO acknowledgement were definitely required; however, recent operating periods had been characterized by repeated and seemingly unnecessary radio and lens failures. As a result, a considerable number of the pilots admitted to having come aboard one or more times in the past without the LSO's acknowledgement.

In retrospect, the pilot felt that he should have taken his own waveoff when no ball was visible and no LSO

communications existed, although the requirement to do so on a Case II, Mode I ACLS approach cannot be documented in NATOPS. It is obvious, however, that a waveoff is indicated under these circumstances until some alternate procedure is developed and published. In this connection, the reporting command has noted that a proposed change to the LSO NATOPS will be submitted, clearly stating the responsibility of the pilot, under IFR conditions, to waveoff if contact is not established with the LSO. In addition, it will be recommended that the LSO NATOPS manual clearly delineate the obligatory and minimum landing criteria for the pilot in a Mode I approach, stating the functional significance of the LSO in conjunction with this type of approach. In the meantime, the reporting command notes that positive communication will be established between all concerned prior to allowing Mode I aircraft to continue an approach to touchdown. Aircrews have also been rebriefed on the importance of complying with existing LSO and CVA/CVS NATOPS procedures.

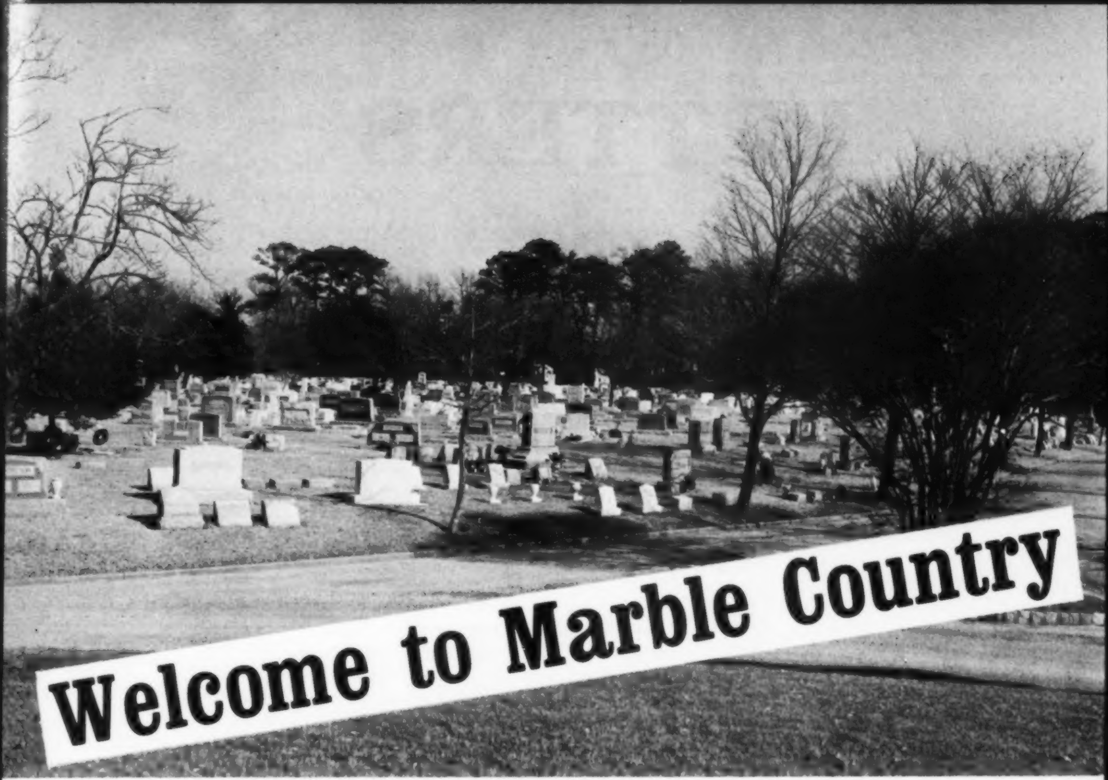
This incident also brought up some points of interest concerning the ACLS equipment and foul deck warning circuits/lights. At the CCA data link console, a DECK CLOSED telelight is illuminated when a fouled deck condition is observed in the tower. This light is the cornerstone of safe operations and cannot be bypassed at the CCA level. When illuminated (by the actuation of a switch in Pri-Fly), an independent circuit is activated which initiates a waveoff of the aircraft automatically; however, this applies only to the last six seconds of the approach. Prior to this incident, some difficulty had been experienced on the ship with spontaneous uncoupling when aircraft were four to six miles out. It was thought that the DECK CLOSED light circuit might be the reason for the spontaneous uncouplings and since the purpose of the sea trials at the time was to gain experience with the system in the touchdown phase for data analysis of landing performance, the decision was made to leave the DECK CLOSED light off.

The DECK CLOSED circuit is independent of the circuit which lights the foul deck lights at the LSO's platform but as an additional safety measure, an indicator corresponding to the LSO's foul deck light had previously been installed in CCA as a separate indication, not connected with the automatic waveoff system. Unfortunately this indicator was out of order at the time of the incident. Therefore as the *Phantom* approached, there was no obvious indication in the CCA room that the deck was fouled although a keen observer in CCA might have garnered this information from the congested picture on the PLAT. As it was, however, the CCA controller was unaware of the foul deck; he only knew that the F-4J was apparently properly coupled and was making its correct ramp time.

The incidents recounted here show clearly that there is a need for the utmost coordination and attention to all aspects of carrier launch and recovery operations. The potential hazards in landings on fouled decks are such that they must not be permitted to occur – for any reason.

The new pilot's enemy is inexperience and the experienced pilot's enemy is complacency.

Flight Surgeon in MOR



COMPLETE

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Featuring

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NATURAL HEAT

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To reach Marble Country, drive in any direction at any time on any street, road or highway at an unsafe speed. Weave in and out of traffic. Play "Bumpsie Bumper" at 40 with the vehicle ahead of you. Disregard all traffic control signs. Turn left at any busy intersection with the red light in your face or go through on yellow when convenient.

NOTE: Should this offer seem unattractive, final transactions may be postponed indefinitely by driving safely at all times.

MAG-56 Safety NATOPS Bltn

LETTERS

It's a small world until it comes to driving in from the airport.
Anon.

High Key (Follow Up)

MARTD, NAS New Orleans – In the Short Snort, "High Key," on page 15 of the January 1970 issue you wrote up an incident about one of our "birds" and to "keep the record straight" I want to call your attention to the history of that blankety-blank throttle box bolt. Your comment might be construed by some readers to mean that faulty inspection procedures or poor maintenance caused the bolt to slip out. Not true! We were the third or fourth operator of the UH-34 to have this happen. Shortly after the incident AFB (Air Frame Bulletin) 48 (Rev. A) was issued by NavAirSysCom and to preclude this situation from occurring again, the bolt is now secured with a castellated, self-locking nut *and* a cotter pin. Another point which may be of interest is that BGEN Keller, CG 4th MAW, commended the pilots and the crew chief of the helicopter for their successful full autorotation to the deck – at night!

CAPT W. O. Meyer, USMC
Maintenance Officer

• The additional information that you have brought out in your letter is appreciated and we are glad to know that the extra precautions in securing the bolt directed by the AFB now make operation of the UH-34 safer. We also add our congratulations to the crew for their professional performance.

Mountain Flying

Fort Carson, Col. – I have just finished reading your article, "Mountain Flying," in the January 1970 issue. First, I would like to express my thanks for a very fine magazine and let you know that it is one of the most sought after publications in our operations area. Though most of the articles deal with "Starched Wings" there have been many dealing with helicopter flying and navigation, as well as instrument procedures, which have been of great help and interest to us in our daily operations.

Fort Carson is located at Colorado Springs, Col., at the foot of the Rocky Mountains. We are a UH-1H *Huey* Company and have Med-Evac responsibility for the Fifth Army with support given to all agencies in the local area that request it. As you can see most of our flying on these missions is in the mountains, or at high altitudes for a helicopter, looking for hunters, hikers and personnel involved in auto accidents as well as for downed aircraft SAR.

Most aviators assigned have little or no experience in the mountains, having either recently returned from Vietnam or just graduated from flight school. All of the Aircraft Commanders have considerable time in the aircraft but are on the order, like myself, of "Flatland Touristers." Thus we are always on the lookout for items that are going to give us at least an even break in flying under these conditions. I have looked for the references used by the author and the only one that I could find was "Mountain Flying Sense." Would you please send me the other articles listed or tell me where to find them so we can have them for all incoming aviators to read and give them a headstart on the mountains?

Again let me express my thanks for a very fine magazine and keep them coming.

Robert E. Sheasly
CW2 AVN
544-38-6133
283rd Aviation Company (ASLT HEL)

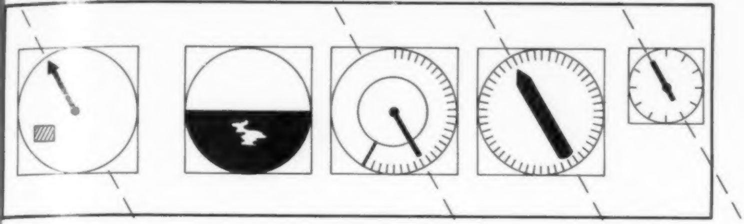
• Your letter was like a ray of sunshine on a bleak winter day. We are sending you the material which you requested and hope it will be of good use for flying in those Rockies.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.
Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

The RIO Effect

Port Orange, Fla. – I noticed a most peculiar phenomenon (nothing new for an East Coast RIO like myself) during one of those hairy night carrier approaches. For no reason I could account for, a nauseating degree of spatial disorientation suddenly arose. We were more or less straight and level, with no speed or configuration changes taking place at the time. Wondering what had caused so sudden an occurrence, I noticed that, while the attitude indicator was showing wings level, all of the needles in the rest of the instruments across the panel were aligned and, if I may use the erroneous illustration, in a "bank." (See illustration.)

Peripheral vision created the illusion that "up" was about 20 degrees right wing down. Although I realized immediately the cause of the disorientation inducement, *I could not shake it* until we had progressed to another position where the dials weren't so unanimous. Now, the cause of my



The RIO effect.

disorientation may have been a conspicuous lack of instrument training, a rather homemade "scan technique" and a tad of "pucker factor." It would seem, however, that a similar situation might develop, and even to a greater extent, in the pilot's seat where there are more instruments. (I realize, of course, that the greater the number of instruments, the less chance of unanimity. I am referring to primary flight instruments.) Perhaps this might be a consideration in accident investigations for some of those "unexplainable accidents" if it has not been already.

As I've not encountered this phenomenon in any of my training or reading, I would like to call it the "RIO Effect" in honor of my esteemed colleagues, of whom it may be said "Disorientation Is Our Trademark."

LT Walt Hall

• Very interesting! In the near future APPROACH will carry an article on another aspect of vertigo, "The Leans."

Near Mid-Air

Tucson, Ariz. – I thought you might be interested in the following item concerning a near-miss collision report. Although every pilot knows that gliders have the right of way, I'll wager that most have never seen one. There aren't more than a thousand gliders in North America and only about 12,000 glider pilots in the U. S. Also gliders don't paint too well on radar – the only solution to avoiding them is to keep those heads up and swiveling.

Dr. Peter Goudinoff
Ass't Professor of Government
University of Arizona

"On December 28, 1969, I was flying a *Blanik* at about 10,000 feet MSL northwest of Ryan Field. Below, with a separation of 1500 to 2000 feet was 2-33, piloted by Bill Swindell and a student, Lee Ellen Marshall. As the nose of my plane (glider) passed through North I saw what I believed to be a wisp of smoke but my ship was moving away from that direction and I was unable to take a good look at what I thought I had seen. As I moved through 270 degrees from that position I heard a noise which made the hair crawl on the back of my neck. I looked downward, and appearing below the 2-33 was an F-4 moving posthaste. It is hard to estimate how close the bird came to our ship but Bill Swindell says he was *nearly deafened and the sailplane was buffeted* by either the shock waves or tip vortices. Since that time we have pretty much decided the F-4 was from another field (probably Navy). The markings were definitely not Air Force – this jet was painted gray on top and white on the bottom. The upshot of the story is the F-4 driver was not illegal because he was well above the control zone over Ryan but the frightening thing is that to this date he probably doesn't know he was just feet away from a midair."

• Professor, reading this makes the hair crawl on the back of our necks. It only goes to prove that with the volume of traffic airborne today *everywhere* no pilot can relax his scan for any length of time. Head up and swiveling – to be sure.

Fasten Seat Belts

FPO San Francisco – Why do Marine pilots allow crew chiefs to occupy jump seats in H-46 aircraft during shipboard landings? The jump seat is plainly marked "Do Not Occupy During Takeoff or Landing." As an aircraft handling officer and an H-46 pilot, I fail to see how a crew chief with a gunner's belt on and leaning out of the passenger door can assist the pilot in landing. Even though we have exceptionally well qualified LSEs, every H-46 lands aboard with the crew chief hanging out of the door or sitting in the jump seat. Perhaps this is necessary in a combat LZ, but aboard an LPH?

PhibPacmouse

• Just taking a guess, from here it sounds as if there is less than desired trust between pilots and LSE's. However, it could be that the pilots subscribe to the theory that the more eyes the better. Whatever the reason *it doesn't sound safe; it's not sanctioned by NATOPS; and it should be discontinued!*

Vol. 15 **approach** No. 10

RADM Roger W. Mehle

Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

Contents

Departments

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Purposes and policies: Approach, published monthly by the Naval Safety Center, presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be considered as regulations, orders or directives and may not be construed as incriminating under Art. 31, UCMJ.

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Next Month

And Then There Were None

Credits

The cover painting this month by Craig Kavafes depicts the legendary F9F-2 *Panther* sweeping in for the attack. Courtesy Grumman Aircraft Corp., Bethpage, L.I. **Pg 5** Photo (top) NAS Los Alamitos. **Pg 14** Art by Don Lips. **Pg 16-19** Photos courtesy NASA. **Pg 39** Cartoon by permission Newsday, Inc. and Norfolk Ledger-Star. **OBC** Art by Max Katz.

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Memorandum

Administrative efforts in connection with Aviation Safety can be divided into those undertaken before the fact, of which this publication is an example; and those undertaken after the fact, of which the most important is the Aircraft Accident Report.

Commanders have the moral as well as the official obligation to effect some significant recovery from the human and material loss represented by a major aircraft accident. In many cases the only recovery that can be made is the discovery and reporting of cause factors. Discovery of cause factors is the duty of the Aircraft Accident Board; reporting of cause factors (and documentation of investigative processes employed) is accomplished by the preparation and submission of the Aircraft Accident Report. The commander who appoints the board and reviews the report must assign to the board, members whose qualifications are commensurate to the tasks they will be required to undertake; and he must demand from the board a report whose content is consistent with their collective capability.

Many of the Aircraft Accident Reports reviewed this calendar year have not met the foregoing requirements. In one instance three endorsers were obliged to supply eight additional pages of analysis and five additional enclosures which should have been supplied by the Aircraft Accident Board.

When additional time, specialized personnel and technical facilities are required for difficult or complex investigations, they are available for the asking. When insufficient or unreliable evidence renders a deductive conclusion doubtful or impossible, investigation must be directed toward possible inductive conclusions. Finally, when recommendations are made they must be relevant and meaningful; endorsements to worn-out rubber-stamp "recommendations" like "re-brief all pilots" are not desirable.

As custodians of public trust, commanders must make a full and correct accounting of losses which are in conduct of public business. The Aircraft Accident Report is that kind of an accounting.

Commanding General
3rd MAW

LIFT and DRAG

By failing to prepare you are preparing to fail.

Benjamin Franklin